The New England
Journal of Medicine

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Volume 240 JUNE 30, 1949 Number 26

MIGRATING THROMBOPHLEBITIS ASSOCIATED WITH CARCINOMA*

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AN apparently idiopathic thrombophlebitis may be associated with visceral carcinoma. In most cases the thrombosis is secondary to direct invasion by the tumor. There are other apparently rare cases in which multiple segments of vein are attacked at a distance from the tumor or its metastases. In these circumstances, the venous disorder takes on a particular form, unique for the great number of veins involved, the tendency for migration of the process from one segment to another, its persistence and its tendency to recrudescence. The affected veins show no invasion by tumor, and little reaction of any type. Some change in the blood favoring thrombosis has been assumed, but not demonstrated. The term "migrating thrombophlebitis associated with carcinoma" is suggested to designate the syndrome. Six cases personally observed are described below. One of these has been previously reported.[1]

The first description of the disease is attributed by most writers to Trousseau.[2] It is probable that Trousseau was emphasizing the association of carcinoma with other and more usual varieties of thrombophlebitis. This matter has been discussed in a previous paper,[1] but may be mentioned again to place the condition in sharper focus. The presence of carcinoma materially increases the incidence of ordinary postoperative and postinfectious thrombophlebitis. Secondly, a vein surrounded or infiltrated by tumor usually undergoes thrombosis. Such a process is commonly observed in the iliac or subclavian veins, when the pelvis or thoracic inlet is the site of metastatic carcinoma. Thirdly, "marantic thrombosis" may occur in the large veins and even in the cardiac chambers, as an expression of terminal debility in patients dying of neoplasm.

The earliest clear description of the form under discussion was presented in 1900 by Osler and McCrae,[3] who cited a previous report by Gouget. Further reports did not appear for many years.[1, 3-14] In 1938 Sproul,[15] by an analysis of 4258 autopsies on patients with cancers of varied origin, found that *multiple* venous thrombosis was present in 31 per cent of the cases of carcinoma of the body or tail of the pancreas, 10 per cent when the lesion was in the head of the pancreas, 2.5 per cent when it was in the lung, and 1.3 per cent when it was in the stomach. In Sproul's series, no other variety of tumor was associated with thrombosis in more than one vein. Kenney[11] has recently reviewed a smaller series of autopsied cases and reached similar conclusions.

The reports of 23 cases,[1, 3-14] which may be classified as migrating phlebitis associated with carcinoma observed during life, in addition to the 6 cases here reported, have been reviewed. In the total of 29 cases, the primary site of the cancer was in the tail or body of the pancreas in 16, the stomach in 4, the lung in 4, the gall bladder in 2 and undetermined sites in 3.

CASE REPORTS

CASE 1.‡ C. W., a 54-year-old farmer, suffered from pain in the epigastrium and chest, gaseous distress after meals, nausea, weakness and weight loss. Four months after the start of the symptoms, multiple, migrating phlebitis, lasting 3 weeks at each site, developed. In 3 months, he had three attacks in each leg, two in each arm and one in the left external jugular vein.

Physical examination disclosed emaciation, acute and subsiding thrombophlebitis in several areas and an enlarged lymph node in the left posterior cervical triangle. Anemia was present. X-ray study revealed calculi in the left kidney and ureter, with some hydronephrosis. The urine diastase was greatly increased (495 units).

Biopsy of the cervical lymph node showed a well differentiated mucus-secreting adenocarcinoma, interpreted as metastatic from a carcinoma of the body or tail of the pancreas.

A thrombophlebitis occurred in the right iliac vein. The patient gradually grew weaker and developed jaundice. He died suddenly, 10 months after the onset of symptoms attributable to the tumor and 6 months after the beginning of the phlebitis. No autopsy was performed.

CASE 2.§ B. A., a 49-year-old physician, complained of severe pain in the interscapular region. Three months later, he began to suffer severe abdominal cramps and diarrhea. He abandoned his practice and drifted into semi-invalidism. Thrombophlebitis, which first occurred 7 1/2 months after the onset of the illness, involved the superficial and deep veins of one

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Aided by a grant from the Charlton Research Fund, Tufts College Medical School.

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‡Previously reported.[1]

§In the latter part of his course, this patient was under the care of Dr. Reginald H. Smithwick, who kindly made his records available.

leg. Within four weeks, the process advanced to new areas in the same leg and spread to the other leg and to both upper extremities.

Significant clinical findings consisted of an increased serum bilirubin, evidence of impaired liver function and the presence of occult blood in the stool. The urine diastase was normal until just before death. Exploratory laparotomy was refused.

The patient's course was characterized by another attack of thrombophlebitis in the superficial veins of one arm, a deepening jaundice and, finally, ascites. He died 13 months after the onset of symptoms of the tumor, and 5 1/2 months after the first attack of thrombophlebitis.

Autopsy, performed by Dr. Rudolph Osgood, showed an adenocarcinoma of the pancreas, with extension about the hilus of the liver, and metastases to that organ and to the celiac lymph nodes. There was thrombosis of the portal vein, and the right femoral and both common and external iliac veins. No carcinoma was demonstrable in the veins, except in those traversing the tumor.

Case 3. A. D., a 57-year-old photoengraver, complained of upper abdominal distress, bloating after meals and loss of appetite. Three months later, he began to experience severe abdominal pain occurring in bouts, especially at night. Constipation became marked. He lost 5 pounds in weight. Thrombophlebitis first appeared in the superficial veins of both forearms and in the left leg 6 months after the onset of the abdominal symptoms. Five weeks later, and while the initial thrombophlebitis was still active, he suffered an erysipelas-like attack in the right leg, seemingly as an allergic reaction to epidermophytosis of the foot. A second attack of phlebitis in the veins of this leg was noted in a few days. This was quickly followed by a third attack in the superficial veins of the left forearm. Biopsy of the latter lesion showed a bland thrombosis.

Significant findings relating to the tumor consisted of a palpable liver edge and evidence of impaired liver function. Neither diastase nor lipase was increased in the blood or urine. A diagnosis of carcinoma of the tail of the pancreas was made. Laparotomy was performed 8 months after the onset of tumor symptoms, and 2 months after the initial attack of thrombophlebitis. An inoperable adenocarcinoma of the tail of the pancreas was found, with metastases in the liver and peritoneum.

Postoperatively, the patient showed increasing emaciation, jaundice and swelling of the abdomen. There was evidence of thrombosis of the deep veins of the lower limbs to the iliac level. One week prior to death, he developed gangrene of the left foot. He died 9 months after the first appearance of abdominal symptoms, and 3 months after the initial attack of thrombophlebitis.

Autopsy, performed by Dr. Philip Le Compte, showed extension of the carcinoma from the tail of the pancreas to the celiac lymph nodes and nerve plexus. The metastases to the liver had broken through to the right perinephric tissues and diaphragm. There was invasion with thrombosis of the splenic artery and vein as they traversed the tumor.

Recent and old thrombosis, without tumor invasion, was widespread in both the portal and the inferior-vena-cava system. The lungs showed a number of old and recent emboli of the smaller arteries, with multiple infarcts. Thrombosis was present in the tributaries of the splenic vein, with splenic infarcts. A fresh thrombosis was also present in the upper superior mesenteric, midcolic and upper jejunal veins. The upper 40 cm. of the jejunum was gangrenous. The middle of the gastroepiploic venous arcade and its tributaries showed fresh thrombosis. The process involved the inferior vena cava from just below the renal veins continuously down both common and the left internal iliac veins, both external iliac and femoral veins and the superficial and deep veins of the lower limbs. Though the main renal veins were spared, the smaller veins of both kidneys were extensively involved, with resultant infarcts. There was extensive thrombosis of the prostatic veins, with evidence of superposition of at least three attacks. The process in the legs was examined in detail. No arterial occlusion was found, and the gangrene of the left foot was therefore attributed to the extensive and repeated venous thrombosis in the limb.

Only where the splenic vessels traversed the tumor was there evidence that cancerous infiltration was responsible for the thrombosis. Otherwise, the thrombosed veins generally showed an absence of reaction, with scattered zones of infiltration with polymorphonuclear leukocytes or lymphocytes. The recurrent nature of the thrombosis was indicated by the variation in the age of the process in different segments of the veins and, in some areas, by thrombosis in vessels recanalized from a previous episode. The tendency to thrombosis did not extend to the arteries. The involvement of the splenic artery was hardly an exception, since such a process within a tumor is commonplace.

Case 4. E. P., a 52-year-old machinist, complained of pain in the lower thoracic portion of the back with a feeling of pressure across the chest. His appetite had become poor, and he lost 30 pounds of weight in 3 months. Two and a half months after the onset of his illness, a thrombophlebitis appeared in the deep and superficial veins of the right foot. Two weeks later, the process extended to the vessels of the upper right calf.

X-ray examination showed a lateral and anterior displacement of the cardia of the stomach. The blood and urine amylase and lipase were not increased. A diagnosis of carcinoma of the tail of the pancreas was made. At laparotomy, an inoperable adenocarcinoma was found in this location, with metastases in the liver.

At the time of this report, the patient is alive, 4 months after the onset of symptoms attributable to the tumor and 1 1/2 months after the onset of the thrombophlebitis.

Case 5. W. G., a 56-year-old machinist, suffered an attack of phlebitis in the left leg, lasting 1 week and associated with a small pulmonary embolism and infarction. Ten days after the initial attack quieted down, a similar process developed in the right calf, lasting 3 weeks. A month later, a third attack developed at the right ankle, migrating through the superficial and deep veins of the right leg. The patient was working and in good condition when seen. He denied any symptoms except those referable to the thrombophlebitis. Hospital study revealed only an anemia. Another attack of phlebitis, involving the superficial veins of the right calf and the left thigh, developed during the period of observation.

Exploratory laparotomy was performed 3 months after the onset of the thrombophlebitis. An inoperable carcinoma of the stomach was found, with metastases to the liver. The pancreas was not involved. Thrombophlebitis was evident postoperatively in the superficial veins of the right upper limb and later in the deep veins of the left leg and foot. In the last months of life, there was recurring inflammation in many veins previously involved.

The patient died 6 months after the first attack of thrombophlebitis. No autopsy was performed.

Case 6.* C. C., a 38-year-old machinist, had suffered a thrombophlebitis in the superficial and deep veins of the left leg. He had been given penicillin in oil intramuscularly. After the third dose, a generalized, itching rash developed, and the medication was discontinued. The phlebitis quieted down after rest, but recurred on return to work. Two months after the onset of the illness, the veins of the right leg were involved. A month and a half later, he suffered a small infarction of each lung. The superficial and deep veins of the left upper limb and then the superficial veins of the right forearm became thrombosed. This was followed by a phlebitis of a vein in the left flank.

Biopsy of a vein from the left forearm showed an angiitis with an exudate rich in eosinophils. The white-cell count was 10,400, with 12 per cent eosinophils. Periarteritis nodosa was suspected, the penicillin in oil being the possible etiologic agent. Examination revealed no findings to suggest visceral carcinoma. A single, large gallstone was seen on x-ray study.

A month later, thrombophlebitis developed in a suprapubic vein and then in a vein in the right thigh. At this time, jaundice was noted. The eosinophil count had fallen to 8 per cent. A third and larger pulmonary infarction occurred, and the inferior vena cava was ligated.

Ten days later, there were signs of a cholecystitis, and a laparotomy was done, 4 months after the first attack of thrombophlebitis. An inoperable carcinoma of the gall bladder was encountered, extending into the lesser omentum and to the hilus of the liver, with direct extension and metastases in that organ.

*Reported through the courtesy of Dr. Walter Garrey.

From this time to death 7 months after the onset of the thrombophlebitis, the inflammation smoldered in the previously involved veins.

Autopsy, performed by Dr. Michael MacKenzie, revealed that the adenocarcinoma had invaded the portal vein and extended into the branches of this vessel in the liver. The liver lymphatics were likewise invaded. The pancreas was not involved. There were multiple infarcts of the kidney and spleen dependent upon thrombosis of fine veins. The iliac veins and the vena cava to the level of the ligature showed an organizing thrombus. Nowhere except in the portal vein was there invasion of the veins by carcinoma. Inflammation was found only in limited zones in the walls of the veins. Here and there a few eosinophils were evident.

Discussion

Clinical Features

Patients with this syndrome are of middle or old age, and of both sexes, men predominating. The patient may present himself because of the venous disease while the carcinoma is unsuspected.

Inflammation of the superficial veins of the legs or forearms is the usual initial complaint, even though one may deduce from the pathological material that many deep veins may be involved early. Thrombophlebitis is apt to be present in the saphenous system at the ankles, extending somewhat onto the dorsa of the feet, a territory ordinarily affected only in the migrating phlebitis of thromboangiitis obliterans. I have not seen the process extend to the distal portion of the foot or onto the toes, however, as it does in thromboangiitis obliterans. Deep calf tenderness and edema suggest involvement of the deep veins of the leg, and pain over the sacral or hip regions suggests pelvic phlebitis.

The thrombophlebitis appears at one or more sites at the outset. The process then extends here and there, often for distances such as from the ankle to the groin, whereas the initial segment may become quiescent, or may show a continuous inflammation for days or weeks. A quiescent area is prone to become inflamed again at almost any time in the disease, and pathological examination indicates that this represents recurrent thrombosis. As in other forms of thrombophlebitis, there is great variation in both local and general signs of reaction. Temperatures up to 100.5°F. are common, though the white-cell count is generally unchanged. In my experience, the fever is uninfluenced by penicillin, as in the usual nonseptic forms of thrombophlebitis.

Multiple pulmonary emboli are very common, though often small and unrecognized. In 1 case (Case 5), the disease was probably first announced by a small pulmonary embolus. This tendency to emboli should be kept in mind particularly in the postoperative state.

As time goes on, the thrombosis becomes more extensive, with involvement often of much of the portal system, of the inferior vena cava and many of its tributaries, and still more of the veins of the extremities. The thrombosis may thus hasten the death of the patient, through pulmonary embolism and through serious injury of viscera, which are more sensitive to venous occlusion than the peripheral parts. The thrombosis in the peripheral veins was extensive enough, however, to cause gangrene of the foot and toes in 1 case (Case 3).

The lack of arterial thrombosis is noteworthy.

Is the patient always doomed once the thrombophlebitis is detected? The thrombophlebitis has already been defined as one in which carcinoma evidently does not invade the involved segments of veins. This may be concluded from the examinations, by biopsy or at autopsy, in the cases reported. Moreover, evidences of blood-borne metastases, outside the probable portal-vein dissemination, have not been disclosed in the affected patients. Therefore, so far as the venous lesion is concerned, it should be possible for the patient to recover if the carcinoma were removable. Yet the carcinoma proved to be inoperable, by the time its presence was recognized, in every case reported, and the patient died within some weeks or months of the onset of the thrombosis. This was true whether the patient's first symptoms were related to the venous process or to the visceral lesion. It remains to be seen whether future earlier recognition of the syndrome, with immediate surgical intervention, will mitigate or reverse the present unfavorable prognosis.

Thrombogenesis

The cause of the thrombosis is unknown. It has already been emphasized that there is no malignant infiltration of the vessel wall. Inflammation of the wall is likewise generally absent, though in some areas one may find foci of a few polymorphonuclear leukocytes, lymphocytes, plasma cells and fibroblasts. This corresponds to the picture seen in the ordinary bland thrombophlebitis of the recumbency state. Sproul[15] suggests that a few cancer cells, which metastasize to the vein and initiate the thrombosis through their local secretory activity, may be overlooked. This appears unlikely in the face of the rarity of metastatic growths in the periphery. Slowing of the blood stream, generally considered important in thrombogenesis, is likewise lacking, except in the splenic vessels actually surrounded by tumor.

This leaves the possibility that the determining factor is some unusual change in the blood, owing possibly to a material generated by the tumor. So far, no changes in blood coagulation have been revealed in the cases reported, though the studies have admittedly been far from exhaustive. It has been pointed out that a characteristic common to the cells of the tumors responsible is that they are mucin secreting. The existence of mucin has not been determined in all the tumors reported, and yet it would not be unusual to find some mucin formation by tumors all entodermic in origin. Still,

this merely emphasizes a category of tumors and does not explain the thrombosis.

The production of digestive enzymes in the presence of tumors of the pancreas has received special attention. This subject is carefully reviewed by Sproul.[15] The tumors of the tail or body are apt to be associated with an overabundance of enzymes in the circulating blood, whereas those of the head, by obstructing the ducts, may cause a diminution in output. It is considered possible that an increased production of enzymes hastens blood coagulation, directly, or indirectly — by facilitating absorption of materials used in the process. Sproul suggests that in cancer of the stomach an achylia gastrica would provide a more favorable medium for the action of the normal pancreatic enzymes. It is my belief that an increased quantity of enzymes in the blood stream might damage the endothelium. This has not been brought out by the determination of lipase and amylase in the early stages of the cases described, but the proteases might be more significant. Unfortunately, no good tests are at present available for the measurement of these enzymes.

Diagnosis

The diagnosis of migrating thrombophlebitis associated with carcinoma is a problem first of ruling out known causes for thrombophlebitis, and then of differentiating various types of idiopathic thrombophlebitis. At the outset, one should carefully exclude usual and adequate causes of the venous disorder. Particular attention should be paid to the presence of varices, a point often difficult to decide when the varices are small. The history may suggest direct invasion of the iliac or subclavian veins by tumor, particularly if a gradually developing lymphatic edema has preceded evidence of venous thrombosis. A thorough physical examination may demonstrate a mass in the thorax or pelvis responsible for such a process. Laboratory studies will help in disclosing a neoplasm or blood dyscrasia.

In most patients in whom a usual cause is not readily found, no specific disease connection will ever be disclosed, and the diagnosis will finally be true "idiopathic thrombophlebitis," so called. But before this diagnosis can be established with reasonable certainty, thromboangiitis obliterans and visceral carcinoma must be ruled out.

The *thrombophlebitis of thromboangiitis obliterans* closely resembles that associated with carcinoma. The criteria for the diagnosis of the former variety have been emphasized in another paper.[16] The patient is generally a much younger person (in the twenties or thirties) who almost invariably uses tobacco. The phlebitis, which is migrating and recurrent, is evident in the same veins as those in the cases associated with carcinoma; *its progress from one area, or one vein to another, is not as rapid or as extensive.* The arteries may or may not have been involved at the time the patient is seen. Biopsy of an inflamed vein often shows a characteristic intraluminal granuloma.

Patients with the thrombophlebitis associated with carcinoma are ordinarily in their late forties, or older. The diagnosis may be indicated by the multiple, migrating and recurrent nature of the process, and is established by the finding of a visceral carcinoma that has not demonstrably invaded the involved veins. The disorder may be suspected when but a single vein is thrombosed, but it is highly improbable if the process does not spread to other segments within a few weeks of the first attack. Furthermore, if months or years have elapsed between a previous attack and the present one, the case is probably one of truly idiopathic thrombophlebitis. Biopsy has so far given no characteristic picture, but may be helpful in ruling out thromboangiitis obliterans.

Treatment

Treatment is of secondary importance to the *search for the responsible neoplasm.* It is evident that suspicion rests on several organs, especially the pancreas, stomach and lung. Diagnostic procedures should be vigorously prosecuted. It is my conviction that exploratory laparotomy should be performed if the presence of a carcinoma is not established otherwise.

Summary

Six personally observed cases of a multiple, migrating and recurrent thrombophlebitis associated with visceral carcinoma are reported. Four of the patients showed carcinoma of the tail or body of the pancreas, 1 a carcinoma of the stomach, and 1 a carcinoma of the gall bladder. In 2 cases the thrombophlebitis was the initial complaint; in the others, it started two and a half to seven and a half months after the onset of the illness.

The thrombophlebitis was a late sign of the carcinoma. Laparotomy was performed in 4 cases and revealed an inoperable carcinoma, three and four months, respectively, after the onset of the thrombophlebitis, in the patients in whom that was the initial complaint, and one and a half and two months after the first attack of phlebitis, in the patients in whom the initial symptoms were referable to the tumor itself. One patient is now alive one and a half months after the onset of the thrombophlebitis — the others died three to seven months after their first attack.

Two patients showed disorders that were probably allergic in nature — 1 an erysipelas-like reaction with a fungous infection of the foot as the possible initiating agent, and the other a condition resembling periarteritis nodosa, with administered penicillin in oil as the likely causative factor.

The term "migrating thrombophlebitis associated with carcinoma" is suggested for the syndrome. (The term is not meant to include a recumbency

thrombosis in a patient with carcinoma, the thrombosis of a vein involved in the tumor or its metastases or a marantic thrombosis in a patient dying of neoplasm.) The involved segments in the process show neither neoplastic infiltration nor any other characteristic finding. The veins of both the upper and lower extremities are involved early, and the intra-abdominal veins at some time of the disease. The latter may lead to visceral necrosis. Once the process has started, new attacks, and recrudescence in previously involved segments, occur rapidly until the death of the patient. The great extent and recurrent nature of the thrombosis were indicated in 1 case by the production of gangrene of the foot, seemingly through the venous process alone. Pulmonary embolism is a common complication.

The initial lesion is most often a carcinoma of the pancreas — especially of the tail or body — or, less often, carcinoma of some other viscus.

The thrombophlebitis must be differentiated from the migrating phlebitis of thromboangiitis obliterans, and the more common "idiopathic thrombophlebitis," in which no associated causal factor can be discovered. The presence of an idiopathic thrombophlebitis with the apparent characteristics of the variety associated with carcinoma is an indication for intensive investigation to discover the neoplasm, including an exploratory laparotomy in some cases. The question of whether or not the carcinoma is ever removable when the thrombophlebitis has already appeared is so far unanswered.

I have recently seen a seventh case through the courtesy of Dr. F. S. Homburger. The patient was a seventy-two-year-old man. The carcinoma was located in the head of the pancreas, with migrating phlebitis of both legs, beginning six months after exploration had revealed an inoperable tumor.

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A MEDICAL SURVEY OF THE ALEUTIAN ISLANDS (1948)*

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THE early health beliefs of the inhabitants of the Aleutian Islands, a territory of the United States stretching in a broken chain from the western end of the Alaskan Peninsula to Kamchatka off the eastern coast of Siberia for a distance of about 1200 miles, are described by Veniaminov as follows:

> The old men taught that whoever should talk badly about the sun, that for instance it heats too much, or hides itself too much, etc., will be blinded by it and not allowed to see its light. The moon will slay its detractor with a stone. And he who talks badly about the stars will be forced by these to count them, failing in which he will lose his mind.
>
> From many beliefs relating to health, long activity, etc., I know only that the fathers and uncles endeavored to get the saliva of some old man, most famous by his undertakings and faultless life, as well as healthy and brave, and such saliva they gave to their children to swallow as a preventive from infections and epidemic diseases and as a means for strengthening the bodily powers. Such old men at their death regaled their grandsons by some of their hair or a part of their garments or the weapon which they carried in their encounters and commanded them to carry these on all occasions so as to prevent misfortune in everything as well as health.

Many of these one hundred larger and smaller islands are clearly remembered by those in the armed forces stationed in this mountainous, rough and inhospitable terrain, not only because of the almost continuous drizzle and fog, the temperature rarely below 0°F. or above 70°F. in the shade, and the winds of intensities well over 100 miles per hour but also for the beauty of an unharnessed nature. Many of the islands are piled up around volcanic masses ranging from an unapproachable structure of gray-white, hard granite to a huge mountain peaked by a snow-capped cone resplendent in its halo of clouds and rare sunshine.

Very little is known of the habits of these island people before the influx of Russian culture around 1741. Veniaminov, a Russian priest of great ability and esteem, spent ten years with the Aleuts (1824–1834) at a time when there had already been an eighty-year contact with the white men, so that

*From the Cardiac Laboratories, Massachusetts General Hospital. This study was sponsored by the Peabody Museum (Harvard University), the Viking Fund, the Office of Naval Research, and the Pacific Science Board. I am indebted to the United States Coast Guard, Navy, Army and Fish and Wild Life Service for their many courtesies.

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perhaps none of his Aleut informers could speak directly of the pre-Russian experiences and culture. Data concerning the appearance of various diseases among the islands with the coming of the Russians have been compiled by Veniaminov and others, including Blaschke, — the first Russian doctor to be sent to the Aleutians in 1835, — and such information has been quoted in this review.

Syphilis and other venereal disease, smallpox, consumption, measles, scurvy, influenza, pneumonia and possibly typhoid fever all made their appearance with the introduction of the new culture. Each newly arrived ship was a potential source of infection for some strange new disease. Because of his lack of immunity to these invasions, the Aleut served as excellent culture material. Diseases that were easily cared for among the white inhabitants reached immense proportions among the islanders. It was reported that in 1845 an epidemic of measles, assuming the "black form," caused near panic among the inhabitants of Kodiak Island and the contiguous mainland. The health of the villagers was entrusted both to the village priest, or shaman, and to a certain number of select people schooled in the art of healing by principles handed down from generation to generation. Usually, this knowledge was kept in one family group and passed on only to the most deserving.

Smallpox exacted a terrific toll of life in 1838, sweeping across the entire length of the Aleutian chain and actually accounting for the terrible death of half of the Alaskan population. Prior to this time explorers sailing along the coastline were surprised to find pox-marked Aleuts around 1786 and attributed this onset to a visit made by the Spaniards ten years earlier. With such menaces lurking in every direction Petroff was indeed surprised to find the rare Aleut who had reached the age of fifty. Such a discovery in any tribe gave proof to the fact that this person must have been one of rugged constitution in early life. Although freed of the major ills, very few people escaped the annoying complaints of eye disease and possibly rheumatic pains. The former was attributed to the smoke-filled huts, or *barabaras*, which gave rise to almost continuous eye irritation. Many of the women folk used their eyes incessantly for fine needlework and now world-famous basketry in a poor light, and thus visual acuity was greatly diminished early in life. The villagers successfully treated occasional nosebleeds by bending the distal phalanx of the small finger — on the side corresponding to that of the nares emitting blood — on itself and tying it in such a position.

Owing to the rocky terrain, many bare feet of the Aleuts were cut by sharp stones, and it was not unusual to see one man, using a bone needle and sinew, sewing up the wound of another while the patient sat complacently holding his foot in position. To exhibit no outward sign of pain was a mark of merit and strength. Severe cuts and burns were usually treated with warm fish oil, warm fresh fox grease or some similar substance. Deep wounds were dusted with parched powdered teeth, the hole being covered with a fresh skin of a mouse. Fractured bones called for the use of splints made from animal bones or driftwood.

In the treatment of dangerous wounds or diseases the Aleut employed both patience and diet. Such conditions were supposedly aided by a complete fast — allowing not one drop of water or any food for two to four days in sequence. To one in such a state, it was believed that food and drink led inevitably to inflammation and death. The intimate knowledge of the use of herbs was essential in the treatment of some ills. For swellings and rheumatic pains various poultices and warm, baked roots were used locally. Fevers were "cured" with bitter concoctions, and diarrheas with astringent herbs. Sore throats and stomach aches were also amenable to similar brews. Warm roots were applied to the chest of one who had complained of pain therein. Some of the local village doctors went through the motions of attempting to sew the lung up inside by actually sewing with thread a small area of the chest overlying the pain. A form of cupping was also used, suction being applied by way of mouth.

Lancing came into practice for cure of chest ailments, and only the artful medicine man, whose skill was handed down from generation to generation, was permitted to do this. Stone points were used, and a thorough knowledge of where and how deep to cut was essential. Only critical conditions were treated in this manner. Even colic was said to have been beneficially aided by such a maneuver. At times a slight degree of lancing over any affected area or organ was of noted aid. Blood letting from both hands and feet was a common practice for tiredness, feebleness, loss of appetite and headache. Another form of treatment in common employment was "holding." Practiced by the older women doctors, this consisted of bringing into the proper anatomic order and laying into place all the apparently affected internal organs of a given illness. Such manipulations have not gone without praise even today. The doctor today utilizes his sense of touch to a commendable degree in the diagnosis of various ills. I have seen hypertension suspected because the pulse in a small temporal artery seemed much stronger than normal.

The treatment of kidney trouble is noteworthy. If a person could not urinate he was placed in a vat-like structure of warm water. The water was heated by a small fire under the tub-like apparatus and kept warm by a deposition of sand in the bottom. Another practice, which is still used, is the giving of a glassful of water previously strained through a cloth containing cracked glass. It is thought that this water contains small particles of the glass, which in turn will clean out the small tubes in the kidney itself. Such a belief gave a clue to the fact that the early Aleut had a knowledge of human anatomy

gleaned, no doubt, from his experience in preparing mummies and his habit of examining the organs of rivals killed during battle. Lutke, in 1827, mentioned this detailed study and knowledge of the anatomy of the human structure. Whether or not the Aleut recognized the difference between an artery and vein before Harvey's time and the circulation of blood is a debatable and interesting point.

Pregnancies were guided to completion by some older woman or female relative. Usually, each village had a midwife schooled in her duties by an older woman. To have her baby resemble a certain person, the pregnant woman had to visualize this person every time she ate or drank. Now and then she underwent the "holding" routine in which everything was put into its proper place. As soon as the child was born the mother was made to assume the squatting position, not being allowed either to lie or to sit down. After the placenta was discharged with the help of abdominal manipulation, the mother's abdomen was tied with a belt or cloth. In turn, she was usually carried to another position and propped up by pads into a squatting position, where she remained for four days. On the fifth day she was washed and permitted to lie or sit down but not to stretch her legs. For forty days she was considered unclean and was not allowed to touch anything edible except for her own food, nor could she see any men. If the baby did not resemble the father, family discord, maltreatment and divorce resulted.

At the beginning of menstruation, usually at fourteen years of age, every girl was immediately segregated in a special corner of her *barabara* so constructed by the hanging of a curtain or a matting. Small pieces of string were tied around each joint, and she was not allowed out of her corner for any purpose. Usually, she was given plenty of twine or yarn to knit. Visits were made only by her mother or close female friends, and she could show herself to no man. For forty days she remained in the same condition, and was finally allowed to leave to bury her pads but was not permitted to look at the sun. For ten more days she spent her time alone cleaning the house from top to bottom. At this time she was usually taken to the side of a sick boy and thus was able to utilize the curative powers that she thought to manifest at that time. Finally, she was freed. If such a tradition went unnoted, it is said that the young lady would eventually turn black as coal and become afflicted with various communicable diseases. Also, unfulfillment of such obligations would drive all living fish and animals away from that particular village, with subsequent starvation of the inhabitants.

Expedition of 1948

During the summer months of 1948 I had the privilege of accompanying a group of scientists from Harvard University's Peabody Museum into this unique region. Such an opportunity was afforded me through the generosity and encouragement of Dr. Paul D. White. The purpose of the over-all project was an anthropologic and archeologic evaluation of the existent Aleutian culture, and although the medical program dealt primarily with cardiovascular problems, an opportunity to observe the changing customs and trend of disease was afforded the observer.

Evaluation of the dental problems was made by an orthodontist, Dr. Coenraad Moorrees, of the Forsyth Dental Infirmary in Boston, and I am indebted to him for any dental information presented.

The population of two villages was studied — people of Nicolski on the island of Umank, one of the Fox Island group, and of Atka, a village of the Andreanov Islands. The former included 51 persons, 31 males and 20 females. The average age of the males was twenty-six and one-tenth years, and that of the females twenty-seven and one-tenth; the average age for both sexes was twenty-six and six-tenths years. Of this group, 4 males and 7 females were ten years of age or below, whereas 3 males and 4 females were above fifty years; the average age for both sexes was twenty-five years. The trend of the present rate of reproduction can be seen here. The latter village, Atka, added 66 people to the survey — 33 males and 33 females. The average age was twenty-six and two-tenths years for the males and twenty-four years for the females. Nine males and 8 females were ten years or below, whereas 4 males and 2 females were fifty years or above. All the inhabitants of Nicolski were included in 9 family name groups, whereas 11 family names embraced all Atkans. Of these 9 family groups at Nicolski all had been visited by tuberculosis, 5 by venereal diseases, 6 by pneumonia, 1 by possible cardiac disorder, 1 by possible cerebral thrombosis, 1 by diphtheria, and 4 by tonsillitis within the past two decades. Tuberculosis claimed as many as 4 victims in 1 family within this period. At Atka, of the 11 families, 9 were afflicted by tuberculosis, 6 by venereal disease, 6 by pneumonia, 1 by possible renal disease, and 1 by possible heart disease. These diseases of the past were quoted from death records and old church records, together with verbal histories available at the time.

With such a background, physical examinations carried out were most revealing. Steller, a botanist who accompanied Behring on his memorable voyage in 1741–42, described the typical appearance of the average Aleut as follows:

> He is of medium stature, strong and square built with muscular arms and legs. The neck is short and the shoulders broad. The complexion is a ruddy one. Theirs is mostly glossy black hair with only a scant beard or none at all on the chin. In this fact they are similar to the inhabitants of Kamchatka and to other East Siberian natives.

Physical examination revealed the average blood pressure at Nicolski to be 128 systolic, 74 diastolic, and that at Atka to be 119 systolic, 72 diastolic. At this point it may be interesting to note some blood pressures taken at typical Eskimo villages (Table 1) and made available to us through the generosity of Miss Heller, a member of the Territorial Department of Alaska. These data are of interest because the anthropologists now believe that the Eskimo is closely related to the Aleut. The average pulse rate among male Aleuts was 66 and that among the females 71. A survey of rampant diseases as evidenced by clinical findings

TABLE 1. *Blood-Pressure Values of Eskimo Peoples in 6 Villages and 1 School.**

AGE	MALE SUBJECTS			FEMALE SUBJECTS		
	NO.	PERCENTAGE OF ESKIMOS	BLOOD PRESSURE	NO.	PERCENTAGE OF ESKIMOS	BLOOD PRESSURE
yr.						
Under 21 ..	50	95	110/69	57	99	116/71
21 to 40 ...	39	86	116/72	63	97	115/72
41 to 60 ...	34	96	102/76	30	93	132/79
Above 60 ..	13	98	126/73	10	100	153/74

*Total of 296 cases.

disclosed that tuberculosis, venereal disease, scabies, refractive errors of the eyes, trachoma and dental caries were most prominent. Hypertension (blood pressure above 140 systolic, 90 diastolic, in a moderately young subject fifty years of age or below) was found in only 1 person at Nicolski a forty-three-year-old man with a blood pressure of 204 systolic, 110 diastolic, in the upper extremities and 100 systolic, 72 diastolic, in the lower extremities. He was suspected of having a mild degree of coarctation, and although there was no x-ray apparatus to substantiate this diagnosis, the presence of intercostal pulsations, lack of femoral pulsations, an enlarged heart by percussion, a hypertensive electrocardiographic picture and a lifelong history of trouble with his health led one to suspect that disease. Another man, sixty-six years of age, had a blood pressure of 180 systolic, 100 diastolic, with no clinical signs or symptoms. Table 2 presents the relative percentages of diseases found at both villages. Other conditions included vitiligo, keloid formation, arcus senilis, folliculitis, alopecia, feeblemindedness, varicosities, kyphoscoliosis, pterygia, a case of possible carcinoma of the stomach, a case of probable beriberi resultant from a long-term period of involuntary encampment in Japan during the war and a case of duodenal ulcer proved by x-ray study in an Army camp. Menstrual disorders were prominent. Cardiac and renal disorders, cirrhosis and multiple avitaminosis were also noted. The degree of dental caries was deplorable. The majority of people had mutilated teeth because of dental decay and subsequent extractions. Mandibular prognathism, with resultant dental malocclusion, was present to a considerable degree. Gingival and periodontal disturbances and the presence of calculus were found only occasionally. It has been stated by the old native Aleuts that before the advent of sugar and starches the condition of the teeth was excellent and that caries per se was relatively unknown. Such a belief seems to be borne out by the discovery that the teeth found in the skulls of the early Aleuts were without caries as it is now known. Scabies was more pronounced in Atka. This infestation was traced back to the World War II, when the Atkan Aleuts were evacuated to southeastern Alaska. Since that time all attempts to control this problem have been unsuccessful. The general morale seemed to be at a low ebb in this village, possibly because of a shortage of food at the time of the survey and a high incidence of disease and inebriety.

Much more investigative work will have to be done on the dietary program as it exists in this region. At the present time suffice it to say that these people maintain the present degree of nutrition on a diet consisting chiefly of fish and seal meat, sea-lion meat, duck, geese, reindeer meat, blubber and very few vegetables and green foods. They have little if any fruit and very little milk, together with a rather sparse supply of sugar and flour. In a preliminary analysis this diet was relatively high in protein, low in carbohydrate and moderate in fat. Vitamins A, B and D were of a low normal value. Vitamin C was extremely low,

TABLE 2. *Diseases among 117 Patients Examined.*

DISEASE	INCIDENCE AT NICOLSKI	INCIDENCE AT ATKA
	%	%
Tuberculosis	17.0	22.0
Venereal disease	19.0	17.5
Scabies	0.5	20.0
Hypertension (blood pressure, 140/90)	1.9	0
Cardiac abnormalities	1.9	0
Renal disorders	0	1.0
Cataract	3.9	1.0
Refractive error	23.5	16.0
Cirrhosis	0	3.1
Trachoma	0	6.3

and calcium and iron were both low. The average nutritional value as estimated at present is approximately 800 to 1400 calories per day. Under this regime the average Aleut cannot work hard without a loss of weight and energy, according to American standards. Luckily, at present he does not have to do much to survive in his communal system of living. Before any criteria of comparison are presented, it must be mentioned that results employing American standards would be subject to question because of the short extremities of the Aleuts, both children and adults. With this in mind one can state that the ratio of weight to height in children was high, the absolute weight averaging less than

one standard deviation below what would be expected for comparable normal white American children. The absolute stature, however, was about three standard deviations below average. In adults the ratio of weight to height seemed to fall within normal limits. Further dietary studies will be forthcoming in a subsequent report.

Various chemical studies were carried out on these fish-eating and meat-eating peoples. It was surprising that of 66 nonprotein nitrogen determinations carried out on the Atka people the average result was 59.5 mg. per 100 cc.; urinalyses were within normal limits. The total proteins in these same people averaged 7.02 gm. per 100 cc. Cholesterol determinations were done on 51 Nicolski people and 66 Atkans. The average was 176 mg. per 100 cc. for the former and 197 mg. per cent for the latter. Almost immediately after the blood had been taken the serum was separated by means of a hand-powered centrifuge, stored in the cold, and sent to the Massachusetts General Hospital within a week for analysis. Miss Rourke and her staff at the Chemical Laboratories of the hospital ran a series of controls on cholesterol determinations after the samples had been standing one, two, three and four weeks and showed thereby that variations from the original result in this period were negligible, as suspected.

Determinations of basal metabolic rates were attempted but were highly unsatisfactory because of the marked prognathism and the fear of the Aleuts in the use of the apparatus. Furthermore, it was thought that this method would surely be a dangerous procedure in this region of active tuberculosis. Determinations on 17 adults ranged from −10 to +17 per cent, however.

Electrocardiograms were done on the entire group, three limb leads and three chest leads (CF_2, CF_4 and CF_5) being employed. One case of paroxysmal auricular fibrillation in a woman of fifty-one years with no apparent structural cardiac disorder was found and this reverted to normal rhythm under the use of 0.4 gm. (6 gr.) of quinidine every two hours for five doses. One case of right-bundle-branch block was found in a man of forty-eight with no signs or symptoms of organic cardiac damage. The forty-three-year-old man with suspected mild coarctation exhibited a moderate degree of left-axis deviation with a low upright T wave in Lead CF_5 in the electrocardiogram. All the remaining tracings fell within the realm of normal.

For some time it has been shown by the anthropologists that most peoples of the New World have blood type "O" whereas Asiatics generally exhibit blood type "B." Therefore, it would be of great interest to know the blood types of the Aleut peoples; to achieve this aim one of the group, Dr. William Laughlin, of the Peabody Museum, typed everyone included in the series. Table 3 gives the results. Of note is the fact that the New World probably was the point of origin of the Aleutian Islanders before migration. This is substantiated by the low value of the subgroup "n." Dr. Laughlin has also been utilizing a method to determine the blood types of skeletal remnants on all specimens brought back to Harvard's Peabody Museum; although a report cannot be given now it will probably be ready soon.

At present the health of the native Aleuts concerns chiefly the jurisdiction of the Alaska Native Service. Each island is visited by the Government health boat, the *Hygeia*, about once every year or two, depending upon the weather and so forth. During this time as much medical and dental work as possible is crowded into the ten days or two weeks spent at each village. The medical personnel aboard Coast Guard boats give readily of their time and facilities at whatever village they may happen to visit during their course of duty. The time spent at various islands is so short, however, that their work is restricted to the emergency category. The Army and Navy installations have also been most generous with their aid to any Aleut requiring attention, although it is not their explicit duty to provide such care. Lastly, each Government schoolteacher has been instructed in the general principles of first aid and has on hand certain of the more useful medications to treat the ill. However, all these measures seem inadequate when the end result is studied. The Aleut has not fared well with the introduction of the white man's culture and needs help desperately not only in organizing a social structure that can cope with the new problems and demands but also in preparing the proper environmental soil in which such a social reformation will thrive. The Aleut, for the most part, is also a spiritually ill person who needs the active guidance of some social or religious organization, Russian Orthodox faith or other, that will renew in him the spark of hope and the time-tested tenets of a good life.

TABLE 3. *Blood Types and Rh Determinations among 117 Aleuts.*

TYPE	PERCENTAGE
0	49.3
A	44.7
B	4.5
AB	2.3
m	69.8
mn	26.9
n	3.2
Rh+	100.0

SUMMARY AND CONCLUSIONS

Data on the present health status of 117 Aleutian Islanders are presented. The findings will be analyzed in subsequent reports.

In some parts of the world there no doubt live groups of people who exhibit the exact basic criteria

for an excellent control in many of the experiments of crucial value in present-day researches, and much can be learned by spending some time among these people, living close to them and observing their habits and customs so that progress in all fields of endeavor can be made. Such a variation of organized analysis and investigation has not to the present been utilized to its best advantage.

The introduction of the white man's culture in an area not properly receptive to the change because of a social and economic structure inadequate to absorb the impact can be definitely detrimental to the persons involved. This has been the situation in the Aleutian area, and it will need to be amended before progress along any line of endeavor can be expected.

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SUPRARENAL HEMORRHAGE IN PREGNANCY*

Report of a Case With a Review of the Literature

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KEELE and Keele[1] made the first attempt to distinguish between the adrenal hemorrhage occurring in the course of septicemia, as in the Waterhouse–Friderichsen syndrome, and the adrenal hemorrhage occurring independently of any infectious process, for which the synonymous terms of hem-

Table 1. *Data in 19 Cases of Suprarenal Hemorrhage.*

Author	Case No.	Sex	Age	Adrenal Gland Involved	Pain	Tenderness
			yr.			
Goolden[2] (1857)	1	M	46	—	Epigastric, very severe, sharp	—
Arnaud[3] (1900)	2	F	17	—	Epigastric, very severe, persistent	Epigastric
Lavenson[4] (1908)	3	F	44	—	Epigastric, severe	Epigastric
Hektoen[5] (1909)	4	M	?	—	Left costal margin; right costal margin; persistent, severe.	Under costal margins
Michaux and Marsset[6] (1923)	5	M	74	—	None	Under costal margins
Pearl and Brunn[7] (1928)	6	M	45	—	Right and left lumbar region, severe, persistent	Right and left costal margins
Barsoum[8] (1936)	7	M	30	—	Diffuse abdominal, severe, persistent	Diffuse
Hall and Hemken[9] (1936)*	8	M	40	—	Left lumbar region, very severe	—
Altschule[10] (1939)	9	M	72	—	Epigastric, very severe, persistent	Epigastric
Keele and Keele[1] (1942)	10	F	32	Right	Below right costal margin, very severe, persistent	Below right costal margin
Williams and Ellis[11] (1944)	11	F	23	Both	Lumbar region, mild	None
Edelman[12] (1945)	12	M	61	Right	Epigastric, severe, radiating to the right	Right upper quadrant
Dodds[13] (1945)	13	F	38	Both	Epigastric, radiating, mild	Right costal margin
Thorstad[14] (1942)	14	M	55	Right	Epigastric	None
Thorstad[14] (1942)	15	M	40	Right	Lumbar region, mild	None
Oddo[15] (1946)†	16	F	36	Left	Left costovertebral angle, severe, lancing	Left renal region
MacMillan[16] (1947)	17	M	60	Both	Epigastric and right upper quadrant, severe	Right upper quadrant
Burnett[17] (1948)	18	F	23	Both	None	—
Arnold, Richer and Lepore (1948)	19	F	22	Right	Right upper quadrant, mild, radiating to right flank	Slight

*An additional case is reported by the authors in an 18-yr.-old girl in early pregnancy, with severe hyperemesis and fatal bilateral adrenal hemorrhage.

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orrhagic suprarenal infarction, acute hemorrhagic adrenalitis, spontaneous suprarenal hemorrhage and suprarenal apoplexy have been suggested.

Table 1, in which the pertinent data of the 19 cases of the literature (including the 1 presented below) are shown in comparison, reveals the condition to be twice as frequent in the male as in the female, without any apparent relation to age, the youngest patient being a girl of seventeen and the oldest a man aged seventy-four years. In 5 cases the site of the hemorrhage was the right adrenal gland; in 1 case the left and in 4 both adrenal glands were involved by the process. No information about the site of the lesion was given in the remaining cases. Considering that the right adrenal vein drains directly into the vena cava (the left goes to the left renal vein), it has been postulated that this is the reason for the more frequent involvement of the right adrenal gland.

As for the mechanisms underlying the process, in 6 of the 19 cases no cause was apparent. In 1 case the hemorrhage developed eleven days after a burn (Arnaud[3]). Trauma was obviously the factor in one of the 2 cases of Thorstad[14] in which there was coexistent renal tuberculosis. A condition of long-standing hypertension, arteriosclerosis and chronic nephritis undoubtedly played a role in the cases of MacMillan,[16] Edelman[12] and Michaux and Marsset.[6] There was a history of questionable grippe in the case of Williams and Ellis.[11] A coexistent bronchiogenic carcinoma was present in the case of Altschule,[10] but there was no evidence that the adrenal glands were the site of metastatic involvement. Pancreatitis was present in Lavenson's[4] case, and the possibility cannot be ruled out that necrotic changes in the retroperitoneal fat had followed the development of this condition. In 5 cases, including the one presented below, the adrenal hemorrhage developed in the course of a pathologic pregnancy—a combination that makes one suspect something more than a mere coincidence.

Case Report*

A 22-year-old primigravida was admitted to the Marlborough Hospital on October 19, 1947, because of pain in the right side of the abdomen, more accentuated at the right costovertebral angle.

The patient had first been seen by one of us (A.G.R.) 75 days previously, when she was 2 1/2 months pregnant. The blood pressure was 150/80, but except for slight intermediate morning nausea and some urinary frequency she had no complaints. She had had the usual childhood diseases without complications, and there was no history of previous hospitalization, accidents or injuries of any sort. The family history was noncontributory. Urinalysis was negative for sugar and

Table 1 (*Continued*).

Case No.	Rigidity	Temperature °F.	Pulse	Respirations	Blood Pressure	White-Cell Count ×10³	Duration	Remarks
1	—	—	—	—	—	—	? mo.	—
2	—	—	—	—	—	—	No. of hr.	Hemorrhage occurred 11th day after burn
3	Slight	95.0	120	45	—	5.2	36 hr.	Patient also had pancreatitis
4	—	97.0	100	—	—	—	21 days	—
5	None	98.0	80	—	—	—	14 hr.	Patient also had chronic nephritis
6	None	102.0	90	50	120/80	16.0	7 days	—
7	Slight	99.0	90	—	—	—	4 days	—
8	Perceivable	104.0 (2nd day)	—	—	—	—	2 days	—
9	Marked	98.0	104	32	140/95	20.0	10 hr.	Patient also had bronchiogenic carcinoma
10	None	98.0	80	20	120/80	22.0	12 hr.	Patient 8 mo. pregnant
11	None	100.0	84	—	—	—	1 day	Patient had questionable mild grippe
12	None	99.2	100	—	140/80 200/98	5.2	6 days	Patient operated on 13 days after admission; recovery. Arteriosclerosis of right adrenal gland.
13	None	98.6	80	—	136/86	26.9	1 day	Hemorrhage occurred 3rd day post partum
14	None	96.4	96	24	120/90	—	3 days	Patient had renal tuberculosis; recent trauma right upper lumbar region.
15	None	97.0	70	20	120/76	16.9	7 days	—
16	None	100.0	104	20	118/80	9.0	123 days	Patient recovered after operation
17	None	Normal	100	26	200/100	10.6	4 days	Patient had had hypertension for several years
18	—	—	—	—	Not obtained	—	2 hr.	Patient 3 mo. pregnant and 2 hr. post abortal; had threatened abortion at 1 mo.
19	Slight	102.0 (3rd day)	120	Normal	160/70	12.0	7 days	Patient 5 mo. pregnant with active bleeding from endometrial implants

†Probably the first successful operation (1938) for adrenal hemorrhage in an adult, although report published later (1946) than that of Edelman[12] (1945).

*The study of this case was made possible by Dr. C. G. Tedeschi, director, Department of Laboratories, Framingham Union Hospital, to whom we express our appreciation.

albumin; the specific gravity was 1.024, and the sediment failed to reveal casts or cells. Nineteen days before admission she was seen again for a dull, intermittent discomfort in the lower back, accentuated by prolonged standing or walking and almost completely relieved by lying down. The blood pressure was 158/70; the temperature was 99°F., and the pulse 114. Urinalysis was negative. On the morning of October 17, on awakening from sleep, she had experienced an increase in the severity of the backache, accompanied by moderate urinary frequency and urgency. She attempted to do some housework but was unable to do so. She returned to bed and remained there for 24 hours with almost complete relief of back discomfort. Six hours prior to hospitalization she began to note abdominal pain that was maximum at the level of and to the right of the umbilicus. This shortly was accompanied by pain in the right costovertebral angle. Hospitalization was deemed advisable.

Physical examination revealed a patient who appeared ill and asthenic, was in obvious distress and complained of pain in the right flank and right middle portion of the abdomen. The skin and the mucous membranes of the lips and of the oral cavity were moderately pale. The abdomen was distended and tender in the right middle quadrant and right flank, with moderate spasm and rigidity in these areas. The uterus was enlarged to the level of the umbilicus. The fetal heart could not be heard. There was no evidence of vaginal bleeding, and rectal examination was negative.

The temperature was 100.2°F., the pulse 120, and the respirations 25. The blood pressure was 160/70.

Examination of the blood disclosed a red-cell count of 4,200,000, with a hemoglobin of 76 per cent, and a white-cell count of 12,050, with 76 per cent neutrophils, 20 per cent lymphocytes, 2 per cent monocytes and 2 per cent eosinophils. Urinalysis was negative.

With the preoperative diagnosis of acute appendicitis, the abdomen was opened through a right-lower-quadrant, pararectus incision. A large amount of serosanguineous fluid flowed from the abdominal cavity. The uterus was enlarged to the size of a 5 months' pregnancy. The appendix, when delivered into the wound, was normal. There was free oozing of blood from the right ovary, in which a number of raised, reddish nodules, suggesting endometrial implants, were visible. The oviducts and the left ovary were normal. The upper abdomen could not be examined owing to the pregnant uterus and the small size of the incision. The appendix was removed, together with small pieces of tissue from the bleeding ovary, and the abdomen was closed in layers with no drainage.

Pathological examination of the specimens showed the appendix to be normal; formations suggesting endometrial implants were recognized in the pieces of ovarian tissue. The patient continued to complain of pain in the right flank, and the abdomen became tympanitic and moderately distended. Penicillin and corpus luteum extracts were given. The temperature, pulse and respirations were within normal limits. The blood pressure was 140/60. On the next day the situation was unchanged. Examination of the blood on the third day showed a drop in both the hemoglobin, which was 67 per cent, and the red-cell count, which was 3,150,000. The urine was normal. In the meantime the temperature had risen to 102°F. The pain in the costovertebral angle had become sharp.

On the 4th day the condition became progressively worse. The abdomen was markedly distended, but there was no nausea or vomiting. The blood pressure had dropped to 134/60, and the red-cell count was 1,950,000, with a hemoglobin of 39 per cent. The patient was still rational and alert.

With the possibility in mind of an intra-abdominal bleeding, the patient was again operated on. Under nitrous oxide, oxygen and ether anesthesia a midline subumbilical incision extending right to the level of the navel was made. A large amount of serosanguineous fluid was free in the abdominal cavity. The implants on the right ovary had shrunk and now appeared as pale gray, slightly raised, flabby nodules. The left ovary was normal, and no change was noticed in the broad ligaments, oviducts or uterus. The left kidney was palpated and found to be normal. The right kidney, however, was encompassed by a semisolid mass, which extended from its lower pole up to the diaphragm, displacing the liver anteromedially. At this time the patient began to breathe laboriously, the pulse became rapid and feeble, and the blood pressure started to drop until it became unperceivable. All possible resuscitation measures were applied without result, and the patient died.

Post-mortem examination* 2 hours after death revealed the body of a well developed, well nourished, extremely pale young woman. Except for the two abdominal incisions no external injuries or lesions of any kind were seen. The abdominal cavity was filled with a serous, sanguineous fluid in which a few blood clots were floating. The peritoneal membranes were blood tinged but smooth and glistening. The intestinal loops were inflated but otherwise not remarkable. The pregnant uterus, oviducts and ovaries were normal. The right kidney was encased by a large, reddish-brown, fluctuating mass, 20 cm. long and 10 cm. thick, of partly clotted and partly fluid blood. Section through this mass revealed a large, swollen, hemorrhagic adrenal gland, 7 cm. long and 2 cm. thick. It was ruptured at one pole and covered by a thick clot of blood. On section, the limits between cortex and medulla could hardly be recognized owing to infiltration of blood. Small islands of golden-yellow tissue, the size of a pinhead or a little larger and suggesting chromaffin tissue, were found adjacent to the ruptured pole of the gland. The other adrenal gland was intact, and none of the other abdominal organs showed changes of significance. The kidneys together weighed 280 gm., and except for a marked pallor neither appeared to be unusual.

Examination of the brain and organs of the chest was not permitted.

Microscopical examination of the right adrenal gland showed both cortex and medulla to be widely infiltrated by well preserved red blood cells, with almost complete obliteration of any normal structure. Large collections of polymorphonuclear leukocytes were noticeable here and there, most numerously in the proximity of yellowish-brown granules of hematic pigment, either free or in large macrophages. A middle-sized vein, close to the hilus, was found almost completely occluded by a recent thrombotic mass, which consisted mainly of blood platelets and of cellular debris imbedded in a structureless eosinophilic material. The vessel wall was swollen by edema and displayed moderate periadventitial infiltration by granulocytic cells. The left adrenal gland was intact, and no significant deviations from the normal were shown by the sections from the liver, spleen, kidneys or gastrointestinal tract. No endometrial implants were revealed in the ovaries. The placenta showed small hemorrhagic infarcts.

Discussion

From the study of the vascular supply of the adrenal gland in nearly 400 bodies Anson and his associates[18] concluded that far more than the usual three arteries depicted in the standard textbooks—often as many as fifty—are present in each gland, all draining into a single vein. If this is the case one wonders why vascular accidents, followed by infarction of the gland, do not occur more frequently. It seems that both increased blood pressure and venous occlusion by the thrombus may have played equally important roles in causing the fatal hemorrhage in the case reported above.

It is difficult to conceive any correlation between the endometriosis and the adrenal hemorrhage, other than a coincidence.

A bearable, persistent pain, made worse by motion, and localized hyperalgesia characterized the onset of the condition in the case described above. As in those reported by others, absence of purpura, which is constant in the Waterhouse–Friderichsen syndrome, is a point of interest.

With the increased oozing of blood into the tissues of the perirenal region the signs and symptoms proper to intra-abdominal hemorrhage made their appearance. At this stage, the pain, which was

*Performed by Dr. C. G. Tedeschi.

mainly referred to the infarcted area, became sharp. Pallor and prostration and drop of blood pressure were signs of the impending collapse.

Inasmuch as adrenal hemorrhage, if left alone, is fatal, the only choice is prompt recognition of the condition, followed by surgical intervention. If we had thought of this possibility and properly explored the adrenal regions at the time of the first operation, perhaps the patient's life could have been saved. This case strongly emphasizes the necessity of including adrenal hemorrhage in the differential diagnosis of any uncertain abdominal situation. If this will be kept in mind it is hoped that other reports of successful interventions will be added to the 2 cases so far reported in the literature.[12, 15]

Summary

A fatal case of intra-abdominal hemorrhage following infarction and rupture of the right adrenal gland in a twenty-two-year-old woman, in the fifth month of pregnancy, with a history of moderate hypertension, is reported. The death is explained by increased blood pressure, complicated by thrombotic occlusion of a relatively large venous branch of the gland. A condition of endometriosis in the right ovary — a most extraordinary and misleading coincidence — was present. The 18 cases previously described in the literature are reviewed and analyzed.

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PROPHYLAXIS AND TREATMENT OF HEAT-REACTION STATES

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NEW YORK CITY

During a severe heat wave in the summer of 1937, 8 of the aged residents of the Home of Old Israel in New York City succumbed in a single day under circumstances that left no doubt that the high environmental temperature was the precipitating cause of death. During the much more severe heat wave in August, 1948, not a single death occurred in the same institution although the mortality rate for the city as a whole was higher than that in 1937. It is believed that the reason for the difference is that the unfortunate experience of 1937 had led to more systematic prophylaxis and treatment of heat-reaction states. This paper presents a discussion of the methods followed since 1938 that have resulted in the striking reduction in the mortality from these conditions in the eleven succeeding years.

Magnitude of the Problem

None of the eight deaths that occurred on the fourth day of the heat wave in 1937 could have been anticipated on the basis of previous medical status, although most of the fatal cases occurred in patients convalescing from infectious or vascular disorders. In several cases the immediate cause of death was heat stroke with hyperpyrexia; in others, heat exhaustion initiated a rapid downhill course. At the same time, other institutions in the metropolitan area had comparable experiences, and there was a sharp rise in the general mortality rate for the city of New York. Similar findings were reported from other cities.[1]

Again, in the latter part of August, 1948, there was a severe and prolonged heat wave that affected a large portion of the country and contributed to a serious rise in the general and infant mortality rates. Although this did not approach the situation in Peking in July, 1743, when 11,000 persons are said to have perished on the streets from the effects of the heat,[2] New York City reported twice as many deaths for the week ending September 3 as for the corresponding week in 1947, or the preceding week in August, 1948 (Fig. 1). Table 1 shows the temperatures and deaths in August, 1948.

The importance of this heat-related mortality increase was further emphasized when it was noted that the last time that the weekly death rate had exceeded the expected death rate by over 100 per

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cent was in February, 1920, when the third wave of the devastating influenza epidemic of 1918–1920 hit the city.

Forty-one homes for the aged in New York City, with a total census of 6688, responded to a questionnaire on the effects of the heat wave that began on August 23, 1948. The total deaths for the control period of August 11 to 20 were 25, whereas the deaths from August 21 to 30 rose to 68, an increase of 172 per cent. In the latter group 82 per cent occurred in the four days beginning with August 27, during which all the 14 cases of heat stroke also occurred. In 22 cases deaths were reported from other causes,

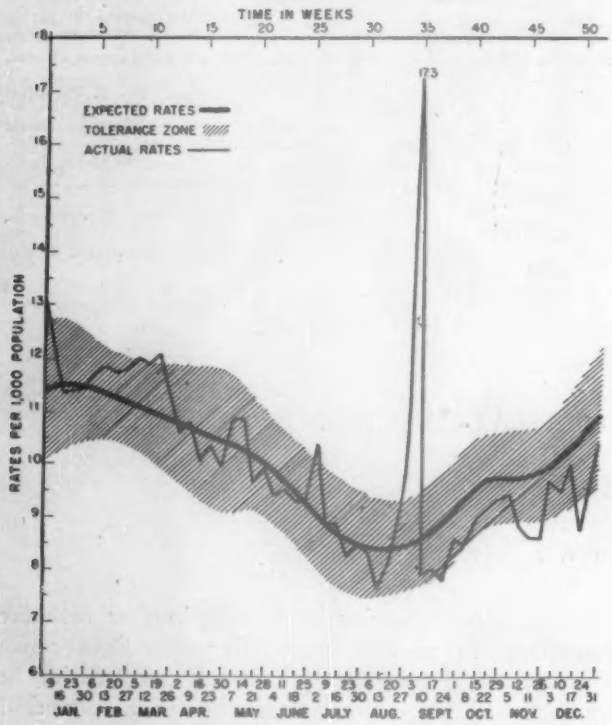

FIGURE 1. *Deaths from All Causes. City of New York, 1948. (Based on Data Supplied by Statistical Division, Bureau of Records and Statistics, Department of Health, New York City.)*

environmental heat effects contributing to the final outcome (Table 2).

After a study of the cases of heat reaction in 1937, a regimen was instituted at the Home of Old Israel for the prophylaxis and early treatment of these conditions. The results have been most gratifying, for there has been no recurrence of group deaths in the past eleven years, including the severe heat wave of 1948.

TYPES

The symptom complexes that result from extreme summer heat are generally classified as heat cramps, heat exhaustion and heat stroke. In the condition known as "sunstroke," the clinical picture of either of the last two syndromes may appear. Heat exhaustion appears when peripheral circulatory failure due to vasomotor disturbance predominates; heat stroke results from the failure of the sweating mechanism through involvement of the hypothalamus, causing hyperpyrexia. Heat cramps do not terminate fatally; the mortality of heat reaction re-

TABLE 1. *Temperatures and Deaths per Day, New York City, August, 1948.*

AUGUST	TEMPERATURES* AVERAGE °F.	TEMPERATURES* HIGH °F.	NO. OF DEATHS†
15–22	—	—	192 (average)
23	74	82	197
24	77	85	196
25	80	91	240
26	90	101	281
27	90	99	446
28	90	99	567
29	86	93	587
30	80	87	390
31	71	79	247

*These are United States Weather Bureau readings, recorded by a sheltered thermometer about 400 feet above street level at the Battery, New York City. Exposed street readings are substantially higher.

†Based on data supplied by Statistical Division, Bureau of Records and Statistics, Department of Health, New York City.

sults from either heat exhaustion or heat stroke. The statistical breakdown between these two conditions seems almost impossible because of difficulties in diagnosis, the tendency to report pre-existing chronic conditions as the primary cause of death and the inclination to reject a diagnosis whose report would automatically result in a medical examiner's inspection.

Heat Cramps

Under normal conditions more than 95 per cent of salt is eliminated by the kidneys,[3] but in heat cramps, the mildest of the heat-reaction states, there is a depletion of sodium chloride as the result

TABLE 2. *Causes of Death for the Week Ending September 3, 1948, Compared to the Expected Average per Week for August, New York City.**

CAUSE	WEEKLY AVERAGE FOR AUGUST	AVERAGE FOR WEEK ENDING SEPTEMBER 3
Cardiovascular-renal	585	1364
Cancer	290	423
Diabetes	60	133
Pneumonia	35	129
Heat stroke	0	48
All others	330	580
Totals	1300	2677

*Based on data supplied by Statistical Division, Bureau of Records and Statistics, Department of Health, New York City.

of excessive perspiration. This is particularly common in an atmosphere of low humidity that facilitates the rapid evaporation of sweat.[4] Excessive ingestion of water during periods of active perspiration may enhance this salt depletion by causing additional loss of salt in the urine. Low-salt diets,

diarrhea and diuresis also predispose to this condition. With acclimatization, the salt content of the sweat is reduced.[5]

In heat cramps there are painful contractions of the voluntary muscles of the extremities and the abdominal wall.[6] Nausea and vertigo may be present. This condition can be prevented by the prophylactic ingestion of salt, or corrected readily by removal of the patient from the hot environment and administration of saline solution by the oral or intravenous route. There is no elevation of body temperature and no significant mortality.

Heat Exhaustion

During heat exhaustion, in addition to heat cramps, there may be peripheral circulatory collapse, nausea, vomiting, scanty urine, headache, giddiness and anorexia. Profuse sweating and sodium depletion are contributory factors. The skin may be cool, moist, pale or cyanotic.[7] Body temperature may be normal, slightly elevated or slightly lowered. In previously normal persons there is generally no direct mortality, especially if the patient is removed from the excessive environmental heat. However, in the aged or those suffering from infections or chronic debilitating diseases, there may be a significant rise in the mortality rate that would commonly have been attributed to the pre-existing condition. This may account for the drop in the general death rate in the weeks following a heat wave (Fig. 1). Many of the patients who succumbed during the period of excessive heat included those suffering from diseases that would ordinarily have been listed in subsequent death reports. Susceptibility to heat exhaustion varies with physical condition and the presence of alcoholism, but the aged are particularly vulnerable, especially those who suffer from debilitating diseases or circulatory impairments[8] (Table 2).

Heat exhaustion may be prevented or controlled by limited exposure or exertion in high environmental temperatures, adequate hydration and an increased salt intake. The amount of salt depends upon the condition of the patient, the degree of excessive perspiration and the ability to restore an output of at least 30 ounces of urine. Although an increased daily ingestion of 5 gm. of salt ordinarily suffices, in extreme cases the need may rise to 50 gm. a day. In the active treatment of heat exhaustion, aside from removal of the patient to a cool place and administration of salt and water, specific treatment may be indicated to combat a state of shock.[9, 10]

Heat Stroke

Heat stroke is an acute disease due to prolonged excessive environmental temperature causing a derangement of the heat-regulating center of the hypothalamus, and characterized clinically by the cessation of sweating, hyperpyrexia and central-nervous-system disturbances. This is the most serious of the heat-reaction syndromes, and may be solely responsible for mortality directly caused by excessive environmental heat in previously normal persons. It is also known as heat hyperpyrexia. Watts[11] was among the first to note that the body temperature was elevated in major heat affections. Salt depletion is not an important factor in this condition, which is even more likely to appear when high humidity reduces the degree of body heat dissipation through lessened sweat evaporation. The sudden cessation of sweating is the important premonitory sign,[12] and the lesser heat syndromes need not coexist. The importance of the cessation of sweating is appreciated when it is recalled that this is the sole method of heat dissipation when the environmental temperature exceeds 95°F.,[13, 14] and that in the evaporation of 1 liter of sweat, 580 calories are absorbed.[15] Conduction, convection and radiation, which perform 70 per cent of this function at ordinary temperatures, are no longer effective.[16, 17]

After several days of extreme summer heat there is a sudden cessation of sweating — a premonitory sign that warrants emphasis. Although there may be increased urination, headache, weakness, nausea or faintness, the clinical condition may be precipitated with sudden collapse and coma. Unless shock is present, the skin is hot, dry and flushed. The body temperature rises sharply and may exceed 106°F. There may be convulsions, cyanosis, vomiting, incontinence, delirium or stupor. Although tachypnea is noted at first, Kussmaul breathing may supervene, and the Cheyne–Stokes type of respiration may be preterminal. Patients who remain ambulatory commonly have a staggering gait. There are difficulties in speech or swallowing, along with dryness of the mouth and excessive thirst. Lower-nephron nephrosis has been reported.[18-20] Persisting coma or delirium has grave prognostic significance.[21]

The mortality rate due to heat stroke is high, particularly among infants, the aged, those suffering from infections or chronic debilitating conditions,[22] and those engaged in physical activity while exposed to excessive environmental heat. In a large series of patients admitted to a general hospital with heat stroke, the mortality was 44 per cent.[23] In the aged the rate is significantly higher. Most of the cases begin to appear about the third or fourth day of a heat wave. After the cessation of sweating and the onset of hyperpyrexia, over 70 per cent of patients die in less than twenty-four hours.[6] Mortality figures for white people are many times higher in the North Central states than in Florida,[24] but this may be due to the effect of seasonal variations on acclimatization.[25] Although Negroes appear to be more vulnerable than white people, and males more often affected than females, occupational activities and outdoor exposure may account for these differ-

ences. It is significant that half the deaths from this cause in the United States have occurred in persons over sixty years of age, whereas 4.5 per cent, the highest in any single year, occurred below one year of age. The factor of individual susceptibility must also be considered.

In the genesis of heat stroke, prolonged exposure is more important, to an extent, than the degree of elevation of environmental temperature. This may be related to a suggested cause of heat stroke, such as exhaustion of the heat-regulating center of the hypothalamus.[12, 26, 27] After recovery from one attack of heat stroke an increased susceptibility to recurrences remains.[21]

Prophylaxis and Treatment

During the 1937 period of extreme summer heat, the significance of the premonitory cessation of sweating in the development of heat stroke was apparent. As a result, the early detection of this sign became an important part of the regimen that was instituted for the management of the aged. Although some deaths still occurred among persons debilitated by severe infections or degenerative disorders, the frequency was greatly decreased, and deaths due to heat stroke among the physically well in the aged population were practically eliminated.

Heat-Wave Regimen

In this heat-wave regimen, light, airy clothing is distributed; frequent bathing and proper skin hygiene are encouraged; physical exertion and prolonged outdoor exposure during midday are discouraged; rest periods in well ventilated rooms are arranged; a light diet with increased carbohydrate and decreased protein is prepared; salted foods are added to the diet and salt tablets distributed at regular intervals; plenty of drinking water and citrus-fruit juices are made available; supplementary vitamin preparations are furnished; and sweat rounds are conducted.

Sweat rounds have been a significant feature of this program, even as the use of an oxygen tent has been most helpful in the treatment of these cases. Several times each day the resident staff routinely inspects all the aged in hospital quarters, as well as those reported ill among the ambulatory. This searching out of the characteristic premonitory sign has been helpful in permitting early therapy in heat stroke.

When a dry skin is noted, even though the body temperature is normal and there are no associated symptoms, the patient is put to bed and clothing is removed. Since air-conditioned rooms are not available at the institution, sponge baths are given frequently, and fans are used to maintain air circulation. The increased drinking of water and ingestion of salt is encouraged. When necessary, salt solutions are administered intravenously.

If sweating does not return in a short while, or if fever is present, the patient is placed in an oxygen tent. Here the air is cooled to below 50°F., air motion is maintained, and low humidity levels are obtained. The increased oxygen tension also is helpful because of the marked rise in metabolism. Generally, this treatment suffices. However, if hyperpyrexia supervenes, the patient may be wrapped in cold wet sheets or sprayed from a water nozzle, and fans directed against the body surface.[1] Iced tub baths may be used,[28] but shock and death have resulted from this drastic procedure. In the latter method, the skin must be massaged while the patient is in the tub. This friction maintains the skin hyperemia; otherwise the overheated blood would be driven to deeper areas.[9]

The control of the central-nervous-system symptoms and the lowering of the temperature, along with the reappearance of sweating, are hopeful prognostic signs. However, even after sweating is restored and the temperature returns to normal, relapses may occur.[12] If sweating returns but fever continues, an intercurrent complication is to be suspected.

Summary

Significant morbidity and mortality result from prolonged exposure to extreme environmental heat. Heat cramps, heat exhaustion and heat stroke are described. The differences in the therapy of heat exhaustion and heat stroke are considered. The importance of sweat rounds is discussed in a regimen for the prophylaxis and treatment of the hyperpyrexia.

It is pointed out that cessation of sweating is a highly characteristic premonitory indication of the onset of heat stroke. During heat waves, careful observation of patients in a home for the aged for the early detection of this cessation of sweating and the immediate institution of appropriate therapy have enormously decreased the incidence of mortality due to heat stroke. The benefits derived from the early use of an oxygen tent are described.

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MEDICAL PROGRESS

PREVENTIVE MEDICINE*

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BOSTON

SEVENTEEN centuries ago Aretaeus[1] of Cappadocia made the first mention in formal medical literature of the practice of isolation as a means of controlling disease, and until recently the control of communicable disease has been the prevailing and only concept of preventive medicine. If one studies the history of preventive medicine the reason for this concept is obvious, but if the new accomplishments in the field are to be placed in their proper perspective, the first realization must be that not the least of the recent advances has been recognition of the profound proportions and province of preventive medicine.

Simmons,[2] although recognizing Smillie's differentiation between public health and preventive medicine (namely, that preventive medicine is an individual responsibility and public health a community one), comes to the wise conclusion that these inevitably overlap and that the final responsibility rests with the medical and allied professions. He defines preventive medicine as "the sum total of all those services required to prevent disease and keep well people well." Armstrong[3] has said, "preventive medicine is not a specialty, but an attitude." Galdston[4] believes "the term preventive medicine is self-limiting in the adjective preventive." Smith and Evans[5] give the following definition: "the intervention of the physician or his technical allies in a limited range of situations in which specific diseases can be warded off or specific deterioration of the patient's condition can be forestalled." They take the broad view that preventive medicine has a definite responsibility to prevent preventable disease; prevent the consequences of curable chronic diseases; and prevent or delay the consequences of nonpreventable, noncurable diseases.

Consideration of these definitions makes one believe with Stieglitz that preventive medicine is thus an integral part of the practice of medicine and has its function in all stages of the patient's existence, from the period of "preconception" to advanced age.

As a tribute to the oldest and still most active field in preventive medicine, advances in the control of communicable diseases are considered first.

COMMUNICABLE DISEASE

Significant increase in diphtheria morbidity in several states shows that immunization in childhood does not provide lifelong security, and that diphtheria is not a disease of infancy and childhood only. Eichelberger[6] reports that 21 per cent of the cases reported in 1946 occurred in the age group ten to nineteen years. In a study of high-school groups in New York City he found that of previously immunized pupils, 20 per cent in junior high, and 18 per cent in senior high school were Schick positive.

Schick testing of American troops in Europe showed that 30 per cent of the persons under thirty-five years of age were Schick positive or combined reactors.[7] (The reliability of the Schick test as a measure of immunity, although open to question, is at present the best means for mass determinations.) As a result of studies showing that diphtheria is becoming relatively more prevalent in the older age groups, and that childhood immunity does not

*The Prize Essay for 1949.

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last a lifetime, it is recommended that booster doses of 0.5 cc. of diphtheria toxoid be given to Schick-positive reactors in the age group from ten to nineteen years. Whereas adults do not tolerate alum-precipitated toxoid well, persons in this age group showed no untoward reactions in the study made by Eichelberger.

The use of triple antigen as described by Sauer[8] is one of the most recent contributions to childhood immunization. He obtained excellent levels of immunity to diphtheria, tetanus and pertussis by administering triple antigen — diphtheria and tetanus toxoids (refined) and pertussis vaccine (alum-precipitated) — after the sixth month of life. Alternate gluteal areas were used, and alum abscess almost completely eliminated when each deeply administered dose was terminated with 0.1 cc. of air, and the site gently massaged.

The Chicago Pediatric Society[9] recommends the schedules of active immunization shown in Table 1.

The Chicago Pediatric Society presents the following suggestion for passive immunization: diphtheria, antitoxin (10,000 units) in known exposure of nonimmunized person; pertussis, human pertussis hyperimmune serum (20 cc.) or hyperimmune globin (2.5 cc.) promptly when indicated, as in known exposure of nonimmunized infant or frail child (dosage as recommended by manufacturer); tetanus, antitoxin (5000 units), promptly administered in the nonimmunized after an injury that might lead to tetanus infection (subsequent immunization with tetanus toxoid is recommended); and measles, human serum globulin for modification or prevention when indicated, dosage recommended by manufacturer being used.

Table 1. *Schedules of Active Immunization.*

Age of Child	Schedule A	Schedule B	Schedule C
3 mo.	Triple antigen (slow absorbing)	Pertussis vaccine (slow absorbing)	
4 mo.	Triple antigen (slow absorbing)	Pertussis vaccine (slow absorbing)	
5 mo.	Triple antigen (slow absorbing)	Pertussis vaccine (slow absorbing)	
6 mo.	Triple antigen (slow absorbing)	Pertussis vaccine (slow absorbing)	Triple antigens (fluid or slow absorbing)
7 mo.	Smallpox vaccination	Diphtheria and tetanus antigens (fluid or slow absorbing)	
8 mo.		Diphtheria and tetanus antigens (fluid or slow absorbing)	Triple antigens (fluid or slow absorbing)
9 mo.		Diphtheria and tetanus antigens (fluid or slow absorbing)	
10 to 12 mo.		Smallpox vaccination	Smallpox vaccination
2 yr.	Booster dose of triple antigen (fluid or slow absorbing)	Booster dose of triple antigen (fluid or slow absorbing)	Booster dose of triple antigen (fluid or slow absorbing)
5 yr.	Booster dose of triple antigen (fluid or slow absorbing)		

From a study by Banton and Miller,[10] it appears that people should receive maintenance doses of tetanus toxoid as well as primary immunization and emergency injections when injury occurs. There is evidence that definite protection lasts for five years, but study of residual titers shows that periodic booster doses should be given for maintenance purposes every three or four years. The study demonstrated that this maintenance dose may be more important than the booster dose at time of injury since many deaths from tetanus occur within four days of date of injury.

Press[11] has expressed the following opinion in immunization against tetanus:

> . . . active immunization against tetanus as a practical public health measure is indicated. Until further information regarding the pathogenesis of the disease or a simple method of estimating the natural antitoxin level is available, it should be given routinely by private physicians, and should be included in health department programs for children.

The toxoid may be given with diphtheria toxoid, or pertussis vaccine, or combined with the two.

It is important that this routine immunization be done because as Press[11] points out, 50 per cent of the injuries leading to tetanus in the civilian population are either so inconsequential as to be entirely unknown or exceedingly trivial. Also, tetanus bacilli are widely distributed, more being found in human feces than that of horses, so that the automobile age is no excuse for lessening our vigilance. Also, recognition of the undesirability of sensitizing people to horse serum that may be caused by the prophylactic use of tetanus antitoxin makes it more desirable to have a previous immunity that can be boosted by another dose of toxoid, which rarely has untoward reactions.

Mention of serum and globulin in immunization brings to mind the tremendous recent contributions made to preventive medicine by establishment of blood banks by hospitals, the American Red Cross and state departments of health. State and hospital services now provide for prenatal examination of blood for the Rh factor; the continued research and the development of facilities for the prevention of erythroblastosis fetalis due to this factor are a magnificent recent advance in preventive medicine.

The widespread use of blood and its derivatives has also presented problems that are now on the way to solution. Homologous serum jaundice and

infectious hepatitis have been recognized as two distinct diseases, varying in incubation period and mortality rate and possessing no cross immunity. Homologous serum jaundice is transmitted by blood and serum, and since there are no laboratory tests for detecting virus SH in plasma and serum, it is recommended that the practical and safe method of routine exposure to ultraviolet rays be made under properly standardized conditions. This causes no change in serum proteins except for a slight decrease in prothrombin and complement, and it inactivates the virus of serum hepatitis.[12] It is also a good idea to keep plasma pools as small as possible.

Since infectious hepatitis can be transmitted by yellow-fever vaccine and dehydrated, liquid and frozen plasma, as well as by flies, food, filth and contaminated water, the ordinary and well known hygienic precautions will prevent its spread. Also, gamma globulin, 300 mg. per kilogram of body weight, will prevent an attack if given to an exposed person before the prodromal symptoms occur.

One of the most spectacular recent accomplishments in preventive medicine is immunization against tuberculosis with BCG. This vaccine has now begun to overcome the unfortunate publicity of the Lubec disaster, and is taking its rightful place, with isolation of open cases, as a major tool in the prevention of tuberculosis, which still ranks seventh in the causes of death, and is first cause in the young adult age group.

According to Birkhaug[13] there are in the United States at the present time almost 180,000 cases of frank tuberculosis left at large to infect the healthy population.

Rosenthal and his co-workers[14] in Chicago, after ten years' experience with BCG, confirmed the fact that vaccination with BCG (an avirulent and benign bovine tubercle bacillus, the bacillus of Calmette–Guérin) inhibits primary tuberculosis in a manner analogous to the specific resistance induced by spontaneous and clinically silent infection with virulent tubercle bacilli.

Heimbeck[15] states that in a group of student nurses working in the tuberculosis wards, victims of the disease were nearly always among the negative tuberculin reactors, and Madson,[16] of Norway, believes that the primary tuberculosis complex produced in negative reactors by BCG vaccination is sufficient to protect against progression of a subsequently superimposed virulent infection. Norway, in 1947, made BCG vaccination compulsory for all persons under fifty years of age. The experience of Holm[17] has been that morbidity and mortality among children in a tuberculous environment has been reduced, after vaccination, to almost zero. He believes BCG to give considerable if not absolute protection.

The BCG Advisory Committee of the State of New York[18] has made the statement that BCG vaccination is the only known practical method of reducing mortality from tuberculosis.

It must be mentioned that the favorable comments on BCG are based on the premise that a positive tuberculin test offers more protection than a negative test — a fact still open to question among authorities. The present opinion of the medical profession is that until further work is done, BCG vaccination should be reserved for negative reactors who are constantly exposed to tuberculosis, such as doctors, nurses, attendants and students.

The development of BCG does not in any way lessen the necessity for diligently pursuing the course of case finding and isolation that has helped bring tuberculosis down from its place in 1900 as first in the leading causes of death.

As an aid in case finding, the detection of tubercle bacilli by fluorescent microscopy may shorten the time necessary to examine a slide, and may in time prove more accurate than the Ziehl–Neelsen staining method. It is valuable at present in screening tests, the standard Ziehl–Neelsen procedure being reserved for questionable fluorescent slides.[19]

Despite the enormous amount of publicity and immense sums of money spent in research, the problem of poliomyelitis remains unsolved at the present time. Recently, however, there has been a saner approach to its epidemiology. It is the consensus at present that it is not necessary to close churches, schools and movies, but places where children come in close contact with each other, such as swimming pools and playgrounds, should be closed. Activities leading to unusual fatigue should be avoided during epidemic time. Patients with poliomyelitis can be admitted to the wards of general hospitals if adequate precautions are carried out.[20] Control of flies is probably of value, but mass spraying of towns with DDT is not warranted in the light of present knowledge. The virus of poliomyelitis has been isolated in both the respiratory and gastrointestinal tracts of human beings, and close contact between human carriers plays an important part in transfer of the infection.[21]

The use of massive doses of penicillin in the treatment of syphilis and gonorrhea is well known and is making case finding an even more effective means of controlling these diseases. Another step forward is the prevention of congenital syphilis by treatment of the mother, early in pregnancy, with penicillin varying from 2,400,000 to 4,000,000 units and following the dosage with careful quantitative serologic titers.[12] Penicillin can be given as late as the seventh month with effect if the infant is viable at the time. Relatively small doses must be given at first, with careful follow-up study, if the Herxheimer reaction is to be avoided. If this is done there is little danger.

In the control of venereal disease considerable progress has been made in the field of education. The available clinics for treatment have been made

known to people, and at the same time the finger of scorn has been removed from those who come for help. The Army made a notable advance along this line when it recently removed the penalty involved when a soldier reported a case.[23]

The morbidity and mortality rates of the armed forces for diseases endemic in war theaters represents an advance in preventive medicine so comprehensive as to be beyond the scope of this paper. However, a few accomplishments must be mentioned. One of these is sanitary control of environment by the use of DDT and its derivatives. It was discovered in Europe and the Pacific[24] that in spite of being adequately vaccinated, men suffered from diseases diagnosed as typhoid and paratyphoid fever when sanitation broke down or when they ate raw vegetables from native fields heavily fertilized with human feces. This emphasizes the fact that preventive medicine is the dual responsibility of those who control the environment and those who seek to increase individual resistance and immunity.

The value of atabrine is now well known, but the important lesson to bear in mind is "that malaria can be controlled anywhere in the world, in any environment, when trained personnel are given the necessary supplies and authority."[25] Preventive medicine may sometimes evoke the same high pitch of enthusiasm that war does, and the combined efforts of research, education and action may bring about equally excellent results in the control of disease in civilian populations.

The streptococcal group of diseases has been the subject of considerable investigation. Lemon[26] has found that, "Chemotherapy with sulfadiazine (in the absence of resistant strains) or penicillin, newer techniques of environmental dust control with oil and air sanitation using germicidal vapors have been shown to have definite value in reducing possibilities for cross infection offered by nasal streptococcal dispersers."

The routine use of scarlet-fever immunization is not necessary, and it should be reserved for persons needing special protection, and for institutional precautions. Scarlet fever at present, for unknown reasons, is a mild disease, and preventive medicine is wisely engaged in seeking the relation of scarlet fever to possible sensitization with the hemolytic streptococcus.

Rheumatic fever is now being given the emphasis it deserves. Griffith[27] has recently pointed out that tuberculosis, syphilis and rheumatic fever remain the most important infectious problems in America. Whether one believes the disease to be infectious or allergic, or both, the fact is that rheumatic fever is still the leading cause of death (except for accidents) among persons five to nineteen years of age. It causes countless cardiac cripples in an age group in which inactivity is particularly frustrating and economic insecurity especially depressing. So little is known concerning the disease that the only recent effective methods of control have been through organized community effort. Griffith[28] has suggested a pattern of study similar to the Framingham tuberculosis demonstration, in which objectives are outlined and public co-operation obtained for a specific program. He bases these ideas on the belief that rheumatic fever is a contact disease and that its epidemiology is the epidemiology of the Group A hemolytic streptococcus.

Experiments with groups of children suffering from rheumatic fever have shown fewer exacerbations of the disease in youngsters treated with prophylactic doses of sulfonamides the year around. The prophylactic use of penicillin preceding oral surgery in patients with rheumatic fever has prevented the occurrence of subacute bacterial endocarditis. The status of the sulfonamides, however, is not sufficiently established for prophylaxis to be made a routine procedure.

Some of the devastating effects of unknown heart disease in patients with mild unrecognized rheumatic fever, as well as those having congenital anomalies amenable to cardiac surgery, may be prevented if attention is paid to the results of mass x-ray study. In heart disease as well as in tuberculosis the development of technics for routine inexpensive mass x-ray examination of the population has made possible the detection of early lesions. Photofluorography has been a satisfactory means of suggesting cardiac abnormalities to be diagnosed by further clinical study. Berenson[29] states that these abnormalities should be looked for in all routine x-ray films, and his series suggests that the number of persons with demonstrable cardiac abnormalities on routine fluorograms is greater than that of patients with tuberculosis in a given population, and that incalculable gains can be made when unsuspected heart disease is diagnosed.

Industrial Medicine

Industrial medicine, which has led in programs of preventive medicine for adults, has a particular responsibility and opportunity to carry on the health education of adults. The accomplishments in this early field of endeavor are well known, but recent recognition of the fact that chronic illness and impaired efficiency due to lack of optimum health of the employee are an important cause of low production and increased operating expense has led to increased emphasis upon attention to minor illnesses to prevent their becoming serious. "In general the frequency of impairment, as measured by reduced effectiveness, is in inverse proportion to the severity."[30] Though the incentive for industrial medicine has been largely a mercenary one, results have been excellent.

Maternal and Child Hygiene

In the field of maternal and child hygiene preventive medicine has made some of its greatest contributions to medical progress. The health and nutrition of the mother during pregnancy have been given considerable study.

Dietary deficiencies have been found to increase the incidence of miscarriages, premature births and stillbirths, and functionally immature infants may be produced by mothers with an inadequate diet during pregnancy.[31] Wesselhoeft[32] has shown that rubella during early pregnancy is a severe hazard to the unborn child and is a problem deserving national investigation and public support, as well as international research.

Early recognition and surgical correction of congenital defects, properly isolated and equipped facilities for the care of the premature infant, and more rigid control in the nursery all are factors in the continued decline in infant mortality.[33] Early ambulation of the mother has prevented many of the unfortunate sequelae of childbirth.

A specific virus has been found for five epidemics of diarrhea of the newborn, but a virus etiology cannot be assumed for a particular epidemic unless the diagnostic work has been carried out by experts. Regardless of the etiology, the fecal-oral route is the usual one causing outbreaks of infant diarrhea in nurseries, and at present the only method of prevention is scrupulous attention to the already well known nursery and formula-room technics. Strict aseptic technic may block the spread of virus as well as bacterial organisms, and the results in many hospitals have shown that by careful observance of rules epidemics can be prevented in spite of the personnel shortage and overcrowding.[34]

Wise retreat may represent an advance. An example is the return to breast feeding, "demand" feeding and "rooming in"[33] that make the present-day baby luckier than his brother born ten years ago, when any resemblance to the normal mother-child relationship was purely coincidental.

Prophylaxis against allergy in children is possible according to Shulman.[35] He believes that a minor sensitization in a child can set off an extensive chain of symptoms, and that every precaution should be taken in infancy to defer upset of allergic balance in the potentially allergic person:

> A program . . . calls for no major deviation from generally accepted practice in infant care. All that is necessary is a knowledge of the infant's inherited allergic tendencies, together with an awareness of the relative allergic potencies of each of the major foods and inhalants.

Two thirds of the cases of bronchiectasis develop in the first two decades of life, and much of the prevention lies in the hands of the pediatrician. Lobar and lobular atelectases lay the foundation for the development of bronchial dilatation by destruction of the bronchial wall. If bacterial pneumonias are diagnosed early and adequate chemotherapy given, and if areas of atelectasis that follow pneumonias and acute respiratory infections are re-expanded promptly, especially in children, much bronchiectasis can be prevented. The immediate removal of foreign bodies and benign endobronchial tumors is another important preventive measure.[36]

An outstanding contribution to preventive medicine for children has been made by the dental profession. The topical application of sodium fluoride to the teeth of children, when done under dental supervision, is effective in reducing dental caries. The United States Public Health Service has set up units all over the country to show the efficacy of this now proved remedy. The American Dental Association has given its approval with the statement: "Fluoride therapy should be used routinely in private dental offices and in school and community health programs." The Dental Section of the American Public Health Association has gone on record as endorsing and encouraging the development of effective methods for making this service available.

Geriatrics

From the enticing prospects of pediatric preventive medicine one must turn to the rapidly growing and newer field of geriatrics. Advances here have been concerned with the problem of preventing or delaying the consequences of the nonpreventable, noncurable diseases. These diseases — heart disease, cancer and nephritis — are the three leading causes of death and, together with cerebrovascular accidents, the fourth cause, represent the etiology of much of the disability of the aged and aging. At the present time one cannot do a great deal to prevent or cure these diseases; geriatrics is making most of its progress by teaching people how to live with, and within, their physical limitations. Arthritis, eye changes and mental hygiene have recently received the attention of the Indiana State Board of Health.[37] The New York State Department of Health gave up its entire June, 1948, issue of *Health News* to "Problems of the Aged." Massachusetts is devoting time and money to the problems of cancer, diabetes and other diseases of the aged. Recreation departments are beginning to realize that programs for persons over sixty-five are a part of their work, and many cities are establishing places of meeting and giving encouragement to clubs that will give happiness and contentment to those no longer in active work. The object of geriatric medicine is to add breadth and depth, rather than mere length, to life,[38] and most of its progress thus far has been in laying the unspectacular but necessary foundations.

One of the major tasks of preventive medicine is the maintenance of physiologic tone in the hope of delaying, mitigating or if possible preventing the degenerative and senescent changes that account for most diseases in later life. One of these diseases

is cancer, and an organized battle against this has begun on all fronts—epidemiologic, research and administrative. The adoption of the Papanicolaou technic for the cytologic diagnosis of cancer of the cervix, lung, prostate and stomach has decreased the mortality. The advantage of this technic is that it makes diagnosis possible in the early stage while surgery is still of use, stained smears often showing malignant cells before any symptoms are evident. The number of false-positive reactions is few, and the incidence of correct diagnoses ranges from about 85 per cent in cervical cancer[39] to 64 to 90 per cent in cancer of the lung.[40] The Mayo Clinic has had some success with the identification of malignant cells in the urine by the use of the Papanicolaou method.[41] As yet, there are too few trained workers in this field, which is one of the newest and most promising in preventive medicine. State health departments are beginning to realize that the chronic diseases of middle age may be studied by epidemiologic methods, and until the etiology is known they will have to be attacked on the administrative rather than on the purely scientific front.

Accident Prevention

It does no good to save persons from death by disease, only to have them die from accidents. The National Office of Vital Statistics[42] states, "Deaths from accidents among children five to nine years of age were three times as great in 1948 as the combined number of deaths from poliomyelitis, and pneumonia, perhaps the most feared of childhood diseases." Accidents now are fifth in the leading causes of death, and until they are removed from this position, must be considered a serious threat to the health of the nation. The medical profession through national, state and local associations has recently become aware of this problem, and is making a determined aid to effect accident-prevention programs. In the age group from ten to fourteen years accidents outranked diseases of the heart, the single greatest nonaccidental cause of death, nearly 5 to 1. Even among young persons in the group in which tuberculosis is the leading cause of death, with heart disease and pneumonia next in line, accidents accounted for nearly twice as many deaths as the three together.

Nutrition

The relation between food and preventive medicine is an ancient one. The Laws of Moses and Aaron[43] recognized that food may be a source of infection. The British Navy, in 1795, included lime juice in its rations, for the prevention of scurvy. Advances in food sanitation and vitamin requirements are beyond the scope of this paper, but the work of Schneider[44] in nutrition and natural resistance to infectious disease must be mentioned. He has localized, but not isolated or identified, in the germ of whole wheat, a new nutritional entity. This agent has been responsible for the increased survivorship in specific breeds (host-genotype) of mice exposed to varying virulences (pathogen-genotype) of typhoid. Dr. F. J. Stare has called this work the highlight of the 1948 Food and Nutrition Section meetings of the American Public Health Association.

The fact that good nutrition not only prevents disease but also is responsible for positive health has long been known. Positive health, not merely the absence of disease, is the most recent and highest objective of preventive medicine, and notable scientific achievements have been made in the field of optimum nutrition. One might reasonably expect, therefore, a population in positive nitrogen balance. Unfortunately this is not true. The gap between what is known and what is done is widened by educational and economic problems that are not so easily solved as the equations of biologic oxidation.

Mental Health

Although preventive medicine has made remarkable progress in all lines of endeavor, its most significant advance in recent years has been the attention that it has given to mental health. Modern society demands that its members live under a tension that is overwhelming, and many have failed to keep the pace required. As standards of living have improved, the need for psychiatry has increased. This is especially true in the very early and very late years of life.

The need of the child for help in adjusting himself to disturbing family situations and the high speed of life in general is being met by the work of such organizations as the Judge Baker Foundation and the James Jackson Putnam Children's Center in Boston, The Philadelphia Child Guidance Clinic, The Langly–Porter School in San Francisco, the Orthogenic School in Chicago, and the Rochester Child Health Institute in Minnesota. These centers not only offer help to the unadjusted child, and thus prevent mental ill health in later life, but also provide training centers for professional personnel. Their aim is preventive psychiatric and "well child" service. Another outstanding advance in this field is the formation of the Association of Psychiatric Clinics for Children, with Dr. Frederick H. Allen as president. Much of the prophylaxis of mental sickness begins in childhood, and the value of child psychiatry in preventive medicine is just now being realized. Dr. Allen[45] says, "The future of this all-important field is full of promise."

There is also the inevitable relation between physical and mental health. Psychosomatic medicine may well be considered a recent advance in the field of mental hygiene. "Physiological tone is so intimately connected with emotional balance that dynamic psychiatry is an indispensable tool of preventive medicine."

Education

The recent scientific advances in preventive medicine have put an additional burden upon the doctor, for as Clark[46] says, "it is safe to say that at least three-fourths of the preventive work made possible by present day medical science must be carried by the practicing physician." Have there been advances in methods of helping the physician to meet this increased responsibility? I believe there have been. Preventive medicine has been recognized as a logical and important part of the medical-school curriculum. Smith and Evans[5] have outlined the work of the department of preventive medicine as follows: to teach the medical student what he needs to know about available technics for the prevention of communicable diseases; to give him understanding of epidemiology, and quantitative methods in medical science; to sensitize him to opportunities for arresting the development of noncommunicable disease; to make him aware of the patient as a person and thus to initiate him more fully into the art of medicine; and ultimately to show him how medicine can help to maintain or increase productive energy in both normal and handicapped persons.

These ideals of education will enable the physician to lessen the gap between what the scientist has discovered and what the people know and do. This is a difficult task. It is easier to vaccinate than to educate, but as surely as vaccination overcomes smallpox, education will overcome the ignorance that makes for misery. Long,[47] however, believes that in time preventive medicine will be taught entirely by the clinical approach, and that when it reaches this ideal a separate department will be unnecessary. This ideal represents an advance in the philosophy of preventive medicine that, when fully realized, will mean that the physician is truly educated to its possibilities.

* * *

The recent advances in preventive medicine have been as diverse as the subject itself. This paper has touched lightly upon a few of them. Perhaps the accomplishments most significant have not been mentioned, for these lie in the invisible realm of thought. Yesterday, on the threshold of bacteriologic science, Sir William Osler said, "preventive medicine is the medicine of the future," and today, on the threshold of the atomic era, one can say that without preventive medicine there will be no future.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

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CASE 35261

PRESENTATION OF CASE

A fifty-five-year-old businessman entered the hospital because of abdominal pain and vomiting.

One night six weeks before admission the patient awoke feeling nauseated, and vomited several times. There was no pain. Business and family worries had been plaguing him, and for several months he had felt tense and nervous. After this episode he remained in bed for four days, and then returned to work. Late at night following days on which financial problems had been particularly trying, spells of painless vomiting recurred. Two weeks before admission he left work. The nocturnal vomiting became more frequent and began to be accompanied by severe cramps starting in the back and radiating around to the midline in a viselike manner. He was given pills and put on a bland diet without relief. Two days before admission the frequency of vomiting increased to every two or three hours; no food or fluid was retained. The vomitus consisted of food, fluid and mucus without blood. The bowels had been moving only with laxatives or with enemas. The stool color was normal. During this illness there was a 25-pound weight loss.

During examination the patient was tense and uncomfortable, constantly shifting position in an effort to relax. When the activity reached a peak, he vomited. The speech was rambling, and he had difficulty recalling dates and time. The heart was normal. There was dullness over the left lower lobe posteriorly and in the left axilla, breath sounds and tactile fremitus being reduced in the same areas. The abdomen showed tenderness and spasm throughout the epigastrium. Peristalsis was active. There were no masses.

The temperature was 98.6°F., the pulse 88, and the respirations 20. The blood pressure was 135 systolic, 90 diastolic.

Examination of the blood revealed a hemoglobin of 14.6 gm. per 100 cc. and a white-cell count of 9600. The urine gave a + test for albumin, and the sediment contained rare casts. The icteric index was 13.

In the hospital the patient was tense and frequently nauseated but appeared to obtain considerable relief from hot baths so that he stopped vomiting and was able to drink water. On the third hospital day the skin and scleras were slightly jaundiced. A surgical consultant found a tender mass in the epigastrium extending to both sides of the midline, but slightly more to the left. The edges of the mass were indefinite; the whole mass was about 15 cm. in diameter. Rectal examination was negative. On the same day the gastrointestinal series showed some thickening of the gastric folds, and there was evidence of pressure along the lesser curvature and the posterior wall. The duodenal loop was enlarged (Fig. 1); the second portion was displaced to the right and showed evidence of somewhat lobulated compression from the region of the pancreas that also displaced the third portion of the duodenum downward. There were several diverticula in the colon. The spleen was enlarged. There was considerable fluid in the left pleural cavity. Linear areas of atelectasis showed in both lower lobes of the lungs, and the motion of both leaves of the diaphragm was slightly limited. On the following day the icteric index was 25, and the serum amylase was 78 units per 100 cc. Three hundred and fifty cc. of opaque, amber fluid, which proved to be sterile, was removed from the left chest. The temperature remained normal.

An operation was performed on the fifth hospital day.

DIFFERENTIAL DIAGNOSIS

DR. RICHARD WARREN: This case presents the problem of differential diagnosis of an epigastric mass, which caused considerable vomiting, slight jaundice and fluid in the left chest. I think we can assume at the outset that since most of the symptoms were localized in the epigastrium, the fluid in the left chest was a sympathetic effusion from infradiaphragmatic disease. Furthermore, it seems logical to suppose that this infradiaphragmatic disease was not necessarily of a suppurative nature. The normal white-cell count would not necessarily convince me of this, were it not also true that the pulse and the temperature were normal. Conditions, therefore, that might lead to the more conventional type of subhepatic and left subdiaphragmatic abscess, such as perforated peptic ulcer and phlegmonous gastritis with abscess, I tend to put into the background. This decision is particularly forceful if one considers that the gastrointestinal series showed no evidence of either.

A perforated gall bladder is unlikely for the same reasons, in addition to the fact that the symptom of pain did not make itself evident until well along in the present illness.

There is so much evidence in this case pointing toward the pancreas — namely, the depression of the lesser curvature of the stomach, the displace-

ment laterally of the second portion of the duodenum, the pain in the back, the elevated serum amylase and the slight jaundice — that it is difficult to escape the conclusion that the lesion was in that organ.

The question regarding the nature of the disease then arises. I believe there are two major types to be considered. The first, and least likely, is apoplexy or rupture of some branch of the splenic artery that could cause a large mass in this region and simulate disease of the pancreatic parenchyma itself. Such ruptures, however, are usually catastrophic and run a more rapid course than this. Furthermore, a hemorrhage causing a mass of this size would have caused an anemia, which was not present. I would vote against apoplexy.

The second type of disease in this patient, and the one that I feel to be most likely, is acute pancreatitis with areas of pancreatic necrosis leading to formation of a so-called pseudocyst of the pancreas. Such a cyst very often occupies the whole lesser omental cavity extending to the diaphragm and causing sympathetic pleural effusion above. It generally contains a serous type of fluid with active pancreatic enzymes within it, although these enzymes often erode small blood vessels and cause rather massive bleeding within the cavity of the cyst. If the cyst is seen early it may contain broken down bits of pancreatic tissue and then is generally termed a pancreatic abscess. The jaundice is caused by inflammatory edema of the head of the pancreas — squeezing of the lower end of the common duct rather than encroachment on the common duct by the cyst. I am not prepared to say definitely what the contents of this cyst were but believe they were of such a nature as to put the mass on the borderline between pancreatic abscess and pancreatic cyst. My diagnosis, therefore, is a large inflammatory pseudocyst of the pancreas causing pleural effusion.

Dr. Reginald Lingley: To begin with, I think this would have to be a tumor of the pancreas. The duodenal loop is tremendously enlarged. There is pressure on the lesser curvature of the stomach, so frequently associated with pancreatic tumor. The irregular mucosa in the second portion of the duodenum and the presence of what looks like small nodules are very much against a cyst. A cyst of the pancreas is sharply defined and smoothly rounded. Although it can produce a pressure defect on the fundus of the stomach and enlargement of the duodenal loop, the enlargement is smooth and sharply defined whereas this is quite nodular. This is not a usual place for an aortic aneurysm. We usually see it on the left side. This extends to the right and corresponds exactly to the head of the pancreas. In addition to the abdominal findings we have fluid in the chest on the left and areas of atelectasis.

Dr. Claude E. Welch: This was an interesting problem in differential diagnosis. The rapid appearance of the epigastric mass, with jaundice and left pleural effusion combined with severe prostration, made me believe that we were probably dealing with a subacute pancreatitis and a large pseudocyst of the pancreas. Carcinoma of the pancreas was considered as an alternative possibility.

The patient's rapid decline made it clear that unless some dramatic relief could be obtained rapidly by operation he would die. Accordingly he was explored with little delay. At operation he was found to have a great deal of bloody fluid throughout the abdomen, with small nodules that were grossly typical of fat necrosis. There was a large hard mass involving the entire pancreas and posterior wall of the stomach. Several of the nodules were removed for biopsy, and a jejunostomy was performed.

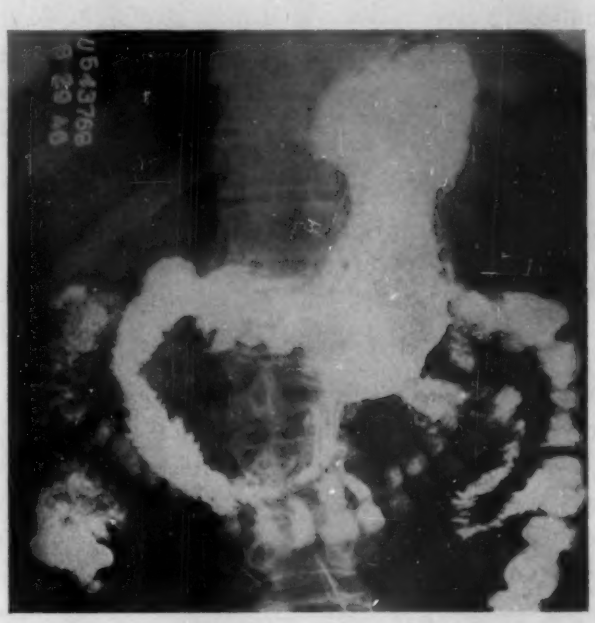

Figure 1.

Clinical Diagnosis

Acute pancreatitis.

Dr. Warren's Diagnosis

Inflammatory pseudocyst of pancreas.

Anatomical Diagnoses

Adenocarcinoma of pancreas, with retroperitoneal and splenic extension, and with microscopic metastases to lungs and kidney.

Hydrothorax, bilateral.

Atelectasis, left lung.

Adenoma of islets of Langerhans, microscopic.

DR. TRACY B. MALLORY: The biopsy specimen removed by Dr. Welch showed a tumor that we thought was epithelial in origin and consistent with primary cancer of the pancreas. The patient went rapidly downhill after operation and died. At post-mortem examination we found the pancreas almost totally replaced by tumor. The same tumor had grown into the hilus of the spleen and occupied two thirds of the spleen. There were metastatic extensions along the retroperitoneal lymph nodes, no metastases in the liver and microscopic metastases to the lung. The sections confirmed the original impression that this was a primary carcinoma of the pancreas. The fact that it had involved the spleen so extensively would suggest that it started near the tail of the pancreas and only secondarily reached the head.

CASE 35262

PRESENTATION OF CASE

A seventy-two-year-old widow was admitted to the hospital because of pain in the right knee.

Thirty to forty years before admission the patient first noted pain, swelling and stiffness of her knees. Multiple tooth extractions and a tonsillectomy and adenoidectomy were done. She was told that she had "tapioca in the knees," and this was aspirated. An infection developed in her left knee following this procedure and drained for a long time. Both knees were ankylosed. Subsequently she had gradual involvement of all joints, with progressive ankylosis and deformity. Twenty-seven years before admission she was treated with a two-month course of radium water, with no relief. Ten years before admission when the right ankle became ankylosed in inversion, the patient received treatments to stretch the ligaments. During this procedure the right tibia and fibula were fractured. The patient became progressively more crippled, with discomfort and stiffness of the joints. There was no real pain until a year before admission, when, while being lifted, she felt her right knee crack. Since then she had constant pain in the right knee, which became swollen. There was no increased heat or redness. An x-ray film showed a pathological fracture with rarefaction of the medial portion of the end of the femur. There were no constitutional symptoms, and in general she felt well.

Six years before admission a uric acid stone was removed from the left kidney.

On physical examination the temperature, pulse and respirations were normal. The blood pressure was 140 systolic, 80 diastolic.

There was limited motion and deformity of all joints. The right knee was swollen and tender, most marked medially. There was no motion of either knee.

The specific gravity of the urine was 1.020, and there was a + test for albumin. The hemoglobin was 13.2 gm. and the white-cell count was 8000, with a normal differential. The sedimentation rate was 1.33 mm. per minute, and the hematocrit was 40 per cent. The blood serum calcium was 9.3 mg., and the phosphorus 4.2 mg. per 100 cc., and the phosphatase was 3.4 units.

An x-ray examination of the right knee showed a markedly narrowed joint, and the adjacent bones were extensively osteoporotic, consistent with old rheumatoid arthritis. Occupying the medial distal extremity of the femur was a large area of bone rarefaction measuring 10 cm. in length by 8 cm. in width (Fig. 1). There was a thin cortical shell medially and posteriorly, while in places there appeared to be loss of continuity of the cortex without, however, frank extension of the mass into the adjacent soft tissues. The lesion had definitely grown in size in comparison with the films taken elsewhere, three months before admission. The femoral shaft above the lesion appeared dense, and its trabeculae somewhat wider than in the left knee, which showed extensive changes of old rheumatoid arthritis.

On the eighth hospital day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. THOMAS ANGLEM:* We might start by looking at the x-ray films.

DR. STANLEY M. WYMAN: This is the original film taken elsewhere, and here is a film taken in comparable projection three months later. The area of bone rarefaction is well demonstrated in the distal femur occupying the femoral condyles. There is an unusual accumulation of amorphous, very dense calcification seen in the lateral aspect of the lesion, with a few small less definite areas of calcification in this region. This is present on both films, and

*Assistant professor of surgery, Boston University School of Medicine; surgeon, Massachusetts Memorial Hospitals.

is seen on other projections to lie definitely in the lesion. The increase in size in the mass is quite apparent compared to the films in similar projection, and one can make out tiny slivers of what I take to be cortical bone remaining, with, in a few places, loss of continuity of the bone. The shaft of the right femur is denser than the left, but the findings are not typical of Paget's disease. Changes, which are quite typical of old, long-standing rheumatoid arthritis, are seen in both knee joints, and osteoporosis is also well demonstrated.

DR. ANGLEM: There are many significant points in this history. The patient had pain in the knee for one year. It seems clear that she had an unmistakable rheumatoid arthritis, which however I do not believe had any bearing on the real issue in this case. Twenty-seven years before admission she had a course of treatment with radium water. This may be a red herring, but on the other hand it may have played a definite part in the etiology of this lesion. Ten years before entry she sustained a fracture of the right tibia and fibula in the course of manipulation of the foot for inversion, which suggests that the bone was unusually friable, and this may perhaps be classed as a pathological fracture. In the course of her present illness she sustained another pathological fracture of the right knee while being lifted. Six years before admission she is reported as having had a uric acid stone of the kidney. Another point that seems of some significance is that she was said to have felt well otherwise. Her only complaint was with reference to the pain in the knee.

On examination the knee showed swelling and tenderness. Her laboratory findings showed nothing of particular significance. The urine gave a + test for albumin. The blood was virtually within normal limits, with a normal calcium, phosphorus and phosphatase, and the sedimentation rate was within normal limits.

The diagnosis, I believe, will rest chiefly on the interpretation of the x-ray films. I think the first thing one has to decide about this lesion is whether it was a benign bone cyst of some kind or a tumor — if a tumor, whether it was benign or malignant, primary in bone or metastatic.

Regarding bone cyst, I am certain that this was not a solitary bone cyst, which usually occurs in the shaft of long bones and is extremely uncommon at this age. The cysts occur almost entirely in childhood or adolescence and are very rare after twenty-one years of age. I believe that we can dismiss bone cyst.

The possibility of cystic change in the bone secondary to parathyroid adenoma is suggested, at least superficially, by the history in this case. The x-ray films are reported as showing some osteoporosis

FIGURE 1.

of the adjacent bone. She is also reported as having had a kidney stone in the past, and there is a history of pathological fracture on two occasions, so that one has to consider this possibility. On the other hand we have no support in the laboratory findings to warrant such a diagnosis. The blood calcium, phosphorus and phosphatase were normal, and although it is possible for parathyroid adenoma to exist with findings within normal range, I do not believe that such a situation existed here. The old

renal calculus was a uric acid and not a calcium stone. I think that we can dismiss benign cystic disease of bone and consider the tumors.

Was this a benign tumor? The only benign tumor that is suggested to me is benign giant-cell tumor. There are features that suggest it rather markedly. The position of the lesion — at least the involvement of the epiphysis — is characteristic of benign giant-cell tumor, and the general contour of the lesion is similar to what one sees in benign giant-cell tumor in this area. On the other hand the degree of extension up the shaft of the bone is unusual, and the areas of density described are not commonly seen in benign giant-cell tumor. The so-called aggressive type of giant-cell tumor, which is undergoing malignant change, must be considered. I believe that this was a malignant tumor, and whether or not it was primary or secondary must still be considered.

Another primary tumor that one has to consider in patients of this age is solitary myeloma. It occurs frequently in old people, although it is not a common disease. Opposed to this diagnosis we have the fact that the patient felt well otherwise, which is not usually the case with myeloma. The patient with myeloma usually has some degree of general malaise, weakness and a greater degree of anemia than this patient showed. There is no report of Bence–Jones protein in the urine, and while its absence is not particularly significant, it would be of significance if present. The serum protein is not reported; it is usually elevated with myeloma. The sedimentation rate is also usually elevated. The x-ray appearance of the lesion does not suggest myeloma.

Reticulum-cell sarcoma must be considered although it is not common at this advanced age. It occurs generally, however, in the shaft of the bone, and the osteolytic lesions produced by this disease do not resemble the x-ray picture that we see in this case. I do not believe that we are dealing with reticulum-cell sarcoma.

Of the primary tumors of bone the diagnosis that I am most strongly attracted to as an explanation of this patient's difficulty is osteolytic osteogenic sarcoma. There may or may not have been a relation between this patient's history of ingestion of radium water twenty-seven years previously, and the lesion in question. During the past twenty-five to thirty years there have been a number of quack remedies on the market purporting to contain radium. Many did not, but on the other hand there were some that actually did contain radioactive material. If the so-called radium water actually contained radioactive substance it may have been responsible for this lesion. One point that is a bit further suggestive of this possibility is the reported appearance of osteitis in the shaft of the femur above this lesion. Osteogenic sarcoma when it occurs as the result of radioactive material occurs on the basis of pre-existing osteitis, which is caused by the radioactive material in the bone. We have some evidence here of a pre-existing osteitis that may have been of significance in the development of this degenerative lesion.

One has to consider metastatic lesions in this case. And, of course, the strongest point against a metastasis is the complete absence of anything in the history or physical examination suggestive of a primary lesion elsewhere. Of the types of malignant tumors of soft tissue or other parts of the body capable of producing osteolytic bone lesions, the most common are breast, thyroid, kidney and adrenal gland, and of these the breast is by all odds the commonest. On the other hand it is very unusual for breast cancer to produce metastases without the breast lesion itself being easily discoverable clinically. It is not mentioned in this history. Carcinoma of the thyroid gland, adrenal gland and kidney may produce metastatic lesions of bone, and they may make their appearance some time before the primary disease is discovered. These possibilities have to be considered, but they do not as a general rule occur in the end of long bones.

On a purely statistical basis, a lesion such as this, even a solitary lesion, occurring at this age is several times more likely to be metastatic than a primary tumor of bone. On the other hand the definite history of ingestion of radium water and the appearance of the lesion on x-ray examination tempt me to make a diagnosis of osteolytic osteogenic sarcoma secondary to radiation osteitis from the ingestion of so-called radium water.

DR. WYMAN: There is one point to add to Dr. Anglem's excellent discussion. We did not have the history of the ingestion of radium water at the time the films were interpreted, and we tended to a diagnosis of osteogenic sarcoma based on possible Paget's disease. However, this is by no means the picture we usually see in Paget's disease, and I

rather favor Dr. Anglem's diagnosis, knowing about the radium now.

Clinical Diagnosis

Osteogenic sarcoma.

Dr. Anglem's Diagnosis

Osteolytic osteogenic sarcoma secondary to ingestion of "radium water."

Anatomical Diagnosis

Fibrosarcoma of femur, invading knee joint; possibly related to ingestion of "radium water."

Pathological Discussion

Dr. Tracy B. Mallory: About a dozen years ago we had a patient in this hospital who was likewise an arthritic and had taken so-called radium water for treatment. She kept it up for a long period, several years, and samples were tested and proved actually to contain radioactive substances. In the case under discussion we have not that positive evidence. The other patient developed a tumor of the knee in exactly the same location as this patient, and the lesion turned out on pathological examination to be a fibrosarcoma, which rapidly metastasized and caused her death.

It is a rather striking coincidence that in the case under discussion the tumor was also in the knee region, involving both the femur and the knee joint, and was also a fibrosarcoma rather than an osteogenic sarcoma. We were not able to demonstrate any radioactivity of tumor or bones. Examination with a Geiger counter was negative, whereas in the preceding case it was definitely positive. But I have a rather strong suspicion that the radioactive material may have had something to do with the development of the tumor but cannot prove it.

Dr. Wyman: What were the changes found in the bone proximal to the lesion?

Dr. Mallory: Not very striking — mild osteoporosis was all we found. In the earlier case the changes were much more extensive, and there was a marked hematopoietic reaction in the bone marrow of the femur; it almost suggested the picture of pernicious anemia.

The lesion occupies the lower end of the shaft of the femur. It extends up beyond what was the epiphyseal line into the diaphysis. The knee joint is completely fused by the old arthritic and septic process. With the specimen in one's hand one can see that the tumor has extended across the slight remnants of the joint space and involved the posterior surface of the patella.

The New England
Journal of Medicine

Formerly
The Boston Medical and Surgical Journal
Established 1828

Official Organ of
THE MASSACHUSETTS MEDICAL SOCIETY
and
THE NEW HAMPSHIRE MEDICAL SOCIETY

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MATERIAL should be received not later than noon on Thursday, three weeks before date of publication.

THE JOURNAL does not hold itself responsible for statements made by any contributor.

COMMUNICATIONS should be addressed to the *New England Journal of Medicine*, 8 Fenway, Boston 15, Massachusetts. Telephone KE 6-2094.

LICENSURE OF FOREIGN GRADUATES

THE Council on Medical Education and Hospitals of the American Medical Association, taking cognizance of the number of foreign physicians who are entering this country with the hope of establishing themselves here, has sponsored an unofficial committee on foreign medical credentials. The membership of this committee is made up of representatives of a number of organizations, including several state licensing boards. Its function is to investigate the entire matter of the licensing of foreign medical graduates and to make recommendations for the solution of the problems involved.

The difficulties that have arisen concerning these physicians, many of them inadequately trained as a result of thirty years of unsettled conditions abroad, have been recognized for some time, and the manner in which they have been met has already been discussed in these columns.*

*Editorial. "Of thee I sing." *New Eng. J. Med.* 239:152, 1948.

The migration to the United States of graduates of foreign schools began about 1926, and as a result of this and conditions brought about by World War II, many states have raised their requirements for licensure. The New York Board of Regents, for instance, no longer admits to the state medical licensing examination graduates of European medical schools who matriculated since January 1, 1940, with the possible exception of graduates of the Universities of Cambridge, of London, of Dublin and of Ireland. This drastic step has been taken for due cause; in the last twenty years 66 per cent of the foreign physicians taking the examinations have failed to pass. In Massachusetts no graduates of any foreign medical school who matriculated later than January 1, 1941, have been permitted to register, except those from Canada.

These matters require serious study in order that foreign schools may as soon as possible be evaluated as are those in the United States and Canada. Reasonable justice in licensure cannot be assured until the quality of the training of applicants can be appraised.

ANNALS OF WORLD HEALTH

THREE years ago the first steps were taken to organize an international health conference. This conference prepared a constitution for the present World Health Organization, which became an official specialized agency of the United Nations in April, 1948, after 26 member nations had signified their acceptance of the constitution. By January of this year 58 nations had become members of WHO.

WHO now publishes in English, French, Spanish, Russian and Chinese each month the *Chronicle*, which contains general information concerning the trend of its work and summaries of its main technical publications; the *Bulletin*, which presents signed articles on subjects under consideration by the organization such as the control, prophylaxis and treatment of malaria, tuberculosis, venereal and epidemic diseases; a weekly epidemiologic record; epidemiologic and vital-statistics reports; and fifteen volumes of official records. These publications are obtainable at moderate cost from the sales section of WHO, Palais des Nations, Geneva.

The expressed aim of the World Health Organization is the improvement of the physical, mental and social health of all peoples. Such improvement is sadly needed. It was thought that progress was gradually being achieved in this direction before 1914, but a generation of cataclysmic disintegration has made one skeptical of the capacity of the human race for any sort of co-operative effort. WHO offers one of the few remaining opportunities to demonstrate that such skepticism is not justified. If medical science, the humanities and religion can be kept out of politics, there is still hope. May this admirable organization be able to point to continued growth and achievement three years hence!

DEAN BERRY AT HARVARD

A NEW · ·an for Harvard Medical School has been selected and will take office on July 1, 1949. Dean C. S. Burwell, who has held the administrative post for nearly thirteen years and who announced earlier in the academic year his intention of returning to teaching and research, is to be succeeded by Dr. George Packer Berry, at present professor of bacteriology and associate dean of the School of Medicine and Dentistry at the University of Rochester.

In addition to his deanship Dr. Berry, whose own investigative work has been in the fields of immunology and virology, will hold an appointment as professor of bacteriology.

A native of Troy, New York, Dr. Berry graduated from Princeton University in 1921 and from the Johns Hopkins University School of Medicine in 1925. After resident services in the Connecticut State Hospital for the Insane, in Bellevue Hospital in New York and in the Johns Hopkins Hospital, he became an assistant and later instructor in medicine in Johns Hopkins University School of Medicine. From 1929 to 1932 he was assistant resident physician in the Hospital of the Rockefeller Institute for Medical Research, and an associate of the Institute. He became professor and head of the Department of Bacteriology and associate professor of medicine at Rochester in 1932, and in 1947 became associate dean. In 1946 Dr. Berry, as an officer of the Naval Reserve on active duty, took part in the atomic-bomb tests at Bikini Atoll.

Dr. Berry is a diplomate of the American Board of Internal Medicine and a fellow of the American Association for the Advancement of Science, the American Public Health Association and the American Medical Association. A former president of the American Association of Immunologists, he has also served as vice-president of the Association of American Medical Colleges.

GEORGE P. BERRY, M.D.

The *Journal*, in welcoming Dr. Berry to New England, at the same time congratulates Harvard on his acquisition, wishing them both a mutually profitable and extended relationship.

A GOOD INSECTICIDE, NOT A POISON

A STATEMENT was recently issued by the Department of Agriculture and the Federal Security Agency calling attention to the proved value of DDT as an insecticide. Some public alarm has been caused by misleading comments concerning possible haz-

ards connected with the use of this chemical. It is pointed out that DDT has contributed materially to the welfare of the world, and should not be brought into disrepute through overemphasis of the well recognized fact that it has toxic properties, especially if improperly used. The ingestion of a tube of toothpaste, or a cake of soap or a bottle of cleaning fluid might be injurious or fatal, and yet they are harmless and useful substances if properly employed.

The fact that DDT, like other insecticides, is a poison, has been given full consideration in the formulation of recommendations for its use: "There is no evidence that the use of DDT in accordance with the recommendations of the various Federal agencies has ever caused human sickness due to the DDT itself. . .despite the fact that thousands of tons have been used annually for the past four or five years, in the home and for crop and animal protection." As a precautionary measure modifications of recommendations have recently been made by the Department of Agriculture for the use of DDT on dairy cattle. There is, however, no justification for any public alarm about the safety of the milk supply from the standpoint of possible DDT contamination. This has been agreed upon by the Department of Agriculture, the Army and the Navy, the Pan-American Sanitary Bureau and the Federal Security Agency.

MASSACHUSETTS MEDICAL SOCIETY

DEATHS

COFFIN — Susan M. Coffin, M.D., of Boston, died on June 1. She was in her sixty-ninth year.

Dr. Coffin received her degree from Boston University School of Medicine in 1910.

A nephew survives.

CONDRICK — James F. Condrick, M.D., of Quincy, died on May 27. He was in his sixty-fourth year.

Dr. Condrick received his degree from Tufts College Medical School in 1919.

His widow survives.

GIDDINGS — Harold G. Giddings, M.D., of Newton, died on May 28. He was in his seventieth year.

Dr. Giddings received his degree from Harvard Medical School in 1907. He was a member of the staff of the Newton-Wellesley Hospital and of the Board of Consultation of the Massachusetts General Hospital and was formerly chief of surgery of the Whidden Memorial Hospital in Everett. He was a former president of the Middlesex South District Medical Society and chairman of the Committee on Arrangements of the Massachusetts Medical Society; for many years he had been a councilor of the Society. He was also a fellow of the American College of Surgeons.

His widow, two sons and a sister survive.

McCORMICK — William A. McCormick, M.D., of New Bedford, died on February 21. He was in his fifty-eighth year.

Dr. McCormick received his degree from Tufts College Medical School in 1914.

His widow, a daughter, a brother and three sisters survive.

MULHERN — Joseph P. Mulhern, M.D., of Worcester, died on March 6. He was in his fifty-eighth year.

Dr. Mulhern received his degree from Tufts College Medical School in 1918. He was a visiting surgeon, orthopedic service, St. Vincent Hospital, member of the courtesy staff in orthopedics, Hahnemann Hospital, and consulting surgeon in orthopedics and president of the board of trustees, Worcester City Hospital. He was a fellow of the American College of Surgeons and American Medical Association.

His widow, six daughters and two sons survive.

NEW HAMPSHIRE MEDICAL SOCIETY

DEATH

ABBOTT — Edson M. Abbott, M.D.; of Rochester, died on May 14. He was in his eighty-first year.

Dr. Abbott received his degree from University of Vermont College of Medicine in 1898.

His widow survives.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

CONSULTATION CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS

The July schedule for Consultation Clinics for Crippled Children in Massachusetts under the provisions of the Social Security Act follows:

CLINIC	DATE	CLINIC CONSULTANT
Haverhill	July 6	William T. Green
Salem	July 11	Paul W. Hugenberger
Gardner	July 12	Carter R. Rowe
Springfield	July 12	Garry deN. Hough, Jr.
Brockton	July 14	George W. Van Gorder
Worcester	July 15	John W. O'Meara
Pittsfield	July 20	Frank A. Slowick
Fall River	July 20	David S. Grice
Hyannis	July 28	Paul L. Norton

Physicians referring new patients to clinics should get in touch with the district health officer to make appointments. Patients are seen by appointment only.

COMMUNICABLE DISEASES IN MASSACHUSETTS FOR APRIL, 1949

RÉSUMÉ

DISEASE	APRIL 1949	APRIL 1948	SEVEN-YEAR MEDIAN
Chancroid	5	0	2*
Chicken pox	2485	1973	1973
Diphtheria	42	18	18
Dog bite	1281	1107	1073
Dysentery, bacillary	2	12	7
German measles	1011	130	398
Gonorrhea	249	254	332
Granuloma inguinale	0	0	0*
Lymphogranuloma venereum	0	1	2*
Malaria	1	3	4
Measles	3921	5950	5512
Meningitis, meningococcal	2	3	16
Meningitis, Pfeiffer-bacillus	8	2	3
Meningitis, pneumococcal	2	2	5
Meningitis, staphylococcal	0	0	0
Meningitis, streptococcal	1	0	1
Meningitis, undetermined	4	2	4
Mumps	1346	2614	1483
Poliomyelitis	1	0	1
Salmonellosis	2	16	6
Scarlet fever	652	812	1422
Syphilis	198	256	342
Tuberculosis, pulmonary	282	242	232
Tuberculosis, other forms	16	6	14
Typhoid fever	5	3	3
Undulant fever	2	3	3
Whooping cough	281	183	499

*Five-year median.

Comment

Diseases whose incidence was above the seven-year median were chicken pox, diphtheria, German measles and typhoid fever.

Diseases whose incidence was below the seven-year median were bacillary dysentery, measles, mumps, salmonellosis, scarlet fever and whooping cough.

Diphtheria was at the highest level for the month of April since 1934.

The seasonal peak for measles was reached in March this year, and that for scarlet fever in February.

Geographical Distribution of Certain Diseases

Diphtheria was reported from: Arlington, 1; Ayer, 1; Billerica, 1; Boston, 30; Cambridge, 4; Malden, 2; Quincy, 2; Somerville, 1; total, 42.

Dysentery, amebic, was reported from: Brookline, 1; total, 1.

Dysentery, bacillary, was reported from: Brockton, 1; Wrentham, 1; total, 2.

Encephalitis, infectious, was reported from: Marshfield, 1; Needham, 1; Watertown, 1; Worcester, 1; total, 4.

Infectious hepatitis was reported from: Newton, 1; Norwood, 1; Wrentham, 6; total, 8.

Lymphocytic choriomeningitis was reported from: Fitchburg, 1; Framingham, 1; Somerville, 1; total, 3.

Malaria was reported from: Lynn, 1; total, 1.

Meningitis, meningococcal, was reported from: Newton, 1; Worcester, 1; total, 2.

Meningitis, Pfeiffer-bacillus, was reported from: Brockton, 1; Gardner, 1; Haverhill, 1; Hull, 1; Milton, 1; Salem, 1; Westfield, 1; West Springfield, 1; total, 8.

Meningitis, pneumococcal, was reported from: Fall River, 1; Worcester, 1; total, 2.

Meningitis, undetermined, was reported from: Braintree, 1; Fall River, 1; Taunton, 1; Wakefield, 1; total, 4.

Poliomyelitis was reported from: Springfield, 1; total, 1.

Salmonellosis was reported from: Greenfield, 1; Newton, 1; total, 2.

Septic sore throat was reported from: Boston, 6; Cambridge, 1; Lynn, 2; Templeton, 1; total, 10.

Tetanus was reported from: Milford, 1; total, 1.

Trichinosis was reported from: Cambridge, 1; total, 1.

Typhoid fever was reported from: Boston, 1; Cambridge, 1; Fairhaven, 1; Lakeville, 1; Randolph, 1; total, 5.

Undulant fever was reported from: Dartmouth, 1; Ware, 1; total, 2.

DISCONTINUANCE OF PAPANICOLAOU SMEAR SERVICE

Because of the large number of smears, and as a result of curtailment of federal funds allocated to the Department of Public Health, it has become necessary for the Massachusetts State Tumor Diagnosis Service to discontinue its service of Papanicolaou smear diagnosis to the cancer clinics of the Commonwealth for the time being.

CORRESPONDENCE

DR. FROTHINGHAM IN REBUTTAL

To the Editor: I appreciate your giving me an opportunity to reply to Dr. Rawls's letter published a week ago in the *Journal*. May I also take this opportunity to commend your attitude of offering all sides an opportunity to present their viewpoint on this controversial subject of the development of a national health program.

If one will read the inaugural address of Dr. Rawls mentioned in his letter, and my letter in the February 17 issue of the *Journal*, I believe it will be evident that Dr. Rawls's letter adds nothing to the clarification of my claim that in his inaugural address there were misstatements of fact and misleading innuendoes. Therefore, it seems to me that no useful purpose will be served in discussing the various statements in his letter.

I should like, however, to say that the Committee for the Nation's Health has never tried to hide the fact that it endeavors to influence legislation in a proper manner, and in accordance with law has always registered as lobbyists members of the group who are paid for this service. In addition to this activity the Committee devotes much more of its time in endeavoring to unite throughout the country the millions of citizens who are interested in the development of a national health program to be financed in part by compulsory health insurance and in educating all the people in the value of such a program.

Channing Frothingham, M.D.
Chairman, Committee for the Nation's Health
101 Bay State Road
Boston 15, Mass.

DRAMAMINE IN MENIERE'S DISEASE

To the Editor: For the past thirteen years, I have suffered from Ménière's disease, with only temporary relief from any form of treatment that has been tried.

In March, 1949, having read about the effect of dramamine on motion sickness, as used by Dr. Leslie N. Gay and Dr. P. E. Carliner at the Johns Hopkins Hospital in Baltimore, I communicated with a representative of G. D. Searle and Company, and Dr. Lee D. van Antwerp, about the effect of dramamine on Ménière's disease. I received the following reply from Dr. van Antwerp:

> At the present time there is no information available concerning the usefulness of dramamine in Ménière's disease, but we readily recognize a causal relation between the pathology of that condition and the presumed disturbed physiology of motion sickness. It is my understanding that Dr. Leslie N. Gay, of Johns Hopkins, is currently conducting a study of the usefulness of dramamine in Ménière's disease, although his information is not yet complete.

I then communicated with Dr. Carliner and asked him if they had had any experience with the use of dramamine in Ménière's disease. Dr. Carliner replied that they had 30 people on dramamine in their investigative work, and I asked to be added to the list. I have been on dramamine since March 15, 1949, with a dramatic and immediate cessation of all vertigo and a 75 per cent improvement in tinnitus and some improvement in hearing in my left ear.

In April, 1949, I asked Dr. Henry L. Haines, of New London, Connecticut, to try dramamine on patients who had Ménière's disease. He now informs me that he has put 3 patients on the drug with immediate and dramatic improvement.

It is hoped that further experience with the use of dramamine in the treatment of Ménière's disease may be obtained so that its benefits can be accurately determined.

William V. Wener, M.D.
Norwich, Connecticut

BOOK REVIEWS

Peripheral Vascular Diseases: Diagnosis and treatment. By David W. Kramer, M.D. With a foreword by Edward L. Bortz, M.D. 8°, cloth, 620 pp., with 157 illustrations. Philadelphia: F. A. Davis Company, 1948. $8.00.

This vascular-conscious period welcomes a treatise based on practical experience and aimed at correlating the accelerated contributions to this ever-expanding field. With this view in mind, Dr. Kramer has succeeded in presenting a readable, lucid, orderly discourse, supplemented with excellent illustrations and tabular differential diagnoses, on peripheral vascular diseases that should constitute a reliable *vade mecum* for the student, general practitioner and internist.

The subject is treated comprehensively in five parts, as follows: symptoms, signs and tests; occlusive arterial disorders; vasomotor disturbances; gangrene and ulcers; and veins, anticoagulants, antibiotics and lymphedema. In the first section on history, symptoms, signs and tests, it is pleasing to see the term "claudication" unmasked and called

by its synonymous term "cramps" — whether of the intermittent or rest type. In the reviewer's teaching and clinical experience, the term "intermittent claudication" always seemed to connote to the uninitiated a symptom pathognomonic only of thromboangiitis obliterans. In the same section the author misses an opportunity, however, to stress the value of inquiring into the history of ingestion of various drugs causing peripheral vascular disease, notably ergot. He does, it is true, devote a later discussion on ergotism under the heading of gangrene and ulcers. In neither the former section under color, as a sign, nor in the latter, does the author refer to the frequently observed, tell-tale, coxcomb color, which characterizes this type of lividity. There is an excellent, illustrated discussion on focal gangrene in diabetes in this section. The chapter on tests is a specific and well illustrated presentation, with a final evaluation. The new tropidore method for reflex vasodilatation carries no reference; it might be the author's own technic, of course. In actual performance, it appears that the author favors the histamine test for capillary appraisal, the sphygmotonograph or recording oscillometer for arterial trunk evaluation, and dermathermic, skin-temperature determinations, before and during general anesthesia by gas, gas ether or cyclopropane, rather than paravertebral block, for vasomotor response. The skin-temperature charts, though simple and adequate, might be labeled more clearly or revised for the purpose of more precise exposition.

In the second section, on occlusive vascular disorders, there is an excellent discussion of acute arteritis, periarteritis nodosa and endarteritis obliterans, as well as the more common conditions. Apropos of the statement under thromboangiitis obliterans that failure of increase in skin temperature after vasomotor tests constitutes a contraindication to ganglionectomy, the reviewer's experience to the contrary does not permit him to subscribe to this only partly correct view. Likewise, issue might be taken with Dr. Kramer's statements that ganglionectomy is attended by an objectionable "mortality rate" (not specified) and that it is a "formidable" procedure. Regarding embolic occlusion, no reference is made to the limb-saving procedure of radical decompressing fascial incisions in popliteal-artery embolism or acute thrombosis.

In the section on vasospasm the author presents a clear picture of the various and obscure conditions mediated by neuroendocrine dysfunction. This clarification of Raynaud's disease, sclermoderma, scalenus anticus syndrome, pneumatic hammer disease, erythromelalgia and so forth is a valuable contribution to understanding of the etiology and clinical characteristics of this perplexing group of conditions. Under Raynaud's disease the author does not stress the currently accepted doctrine of preganglionic section. In the treatment of the acute phase of traumatic arteriospasm, paravertebral ganglionic block, repeated if necessary, is not mentioned.

A good résumé of the entire field of peripheral vascular disease from the obverse side is afforded in the fourth section on gangrene and chronic leg ulcers with, however, several surgical shortcomings, such as failure to mention femoral-vein ligation, lumbar ganglionectomy and the Linton operation in the treatment of chronic varicose and post-phlebitic ulcers.

The last section is devoted to veins, antibiotics and lymphedema with, again, characteristic excellent clinical descriptions. The ubiquitous problem of varicose veins is discussed fully, and in its development, the discussion contains a desirable and complete review of the various tests employed in the study of this condition. From the surgical point of view there is room for disagreement with the author's preference for high saphenous ligation and retrograde sclerosing injection in the light of the modern trend toward stripping, total or segmental, or multiple ligation, or both.

To the reviewer Dr. Kramer's book is obviously an internist's treatise, lacking in the highly important details of surgical treatment. In the light of this criticism it cannot be accepted that the author fulfilled his aim, as stated in the preface, of "the value of explicitness" in the treatment of these disorders. The author might have warned the reader of his legitimate limitation of discussion of surgical technics to general terms. This treatise does, however, "lead the reader through the basic subjects into diagnosis and treatment" with clarity, ease of style and a wealth of bibliographic information.

Premature Infants: A manual for physicians. By Ethel C. Dunham, M.D. 8°, paper, 401 pp., with 31 illustrations and frontispiece. Washington, D. C.: United States Government Printing Office, 1948. $1.25. Children's Bureau Publication No. 325, 1948.

It may be said that this so-called manual constitutes an up-to-date treatise on prematurity and the general care of the premature infant. The subject is important, since it is estimated that 5 per cent of all births in the United States fall into this class, and that the single greatest cause of infant mortality in the first month of life is premature birth, which accounts for half of all infant deaths in the period. The text is divided into two main parts: "General Considerations," analyzing the incidence, causes, and prevention of immaturity, and the growth and development of premature infants; and "Clinical Considerations," dealing with physical problems and clinical care, including the neonatal period, resuscitation, incubator care, nutrition, congenital malformations and birth injuries, infection, abnormal blood conditions, metabolic and nutritional disturbances and other conditions. Dr. Dunham is well qualified to write this comprehensive guide. She received her degree from Johns Hopkins University School of Medicine and taught in the Pediatric Department of the Yale University School of Medicine before joining the Children's Bureau in 1927. She is a member of the American Pediatric Society and a fellow of the American Academy of Pediatrics. The material is well organized, and the text well written. An extensive bibliography is appended to each part, and there is a good index. The type and printing are excellent. The book is worth a number of times its low price and should be in all medical libraries and in the collections of all obstetricians and pediatricians.

Report of the Sanitary Commission of Massachusetts 1850. By Lemuel Shattuck and others. With a foreword by Charles-Edward A. Winslow. 8°, cloth, 321 pp. Cambridge: Harvard University Press, 1948. $4.50.

This reprint of a classic on public health is only partial, for it does not contain the appendix of 218 pages and the index. The original report comprised 544 pages and was issued in a heavy, paper cover. This appendix is important since it contains many of the factual data upon which the report of the Commission was written. The Commission consisted of Lemuel Shattuck, Nathaniel P. Banks, Jr., and Jehiel Abbott. Although the report is attributed to the Commission the actual author was Lemuel Shattuck, of Boston. The partial reprint is preceded by a foreword by C-E. A. Winslow, a noted expert on the subject, in which he states:

> Surely this is an outstanding document for the year 1850 and it has its message for us in 1948. Johann Peter Frank, Chadwick, Simon, Sedgwick, Chapin, have written classics in the science of public health; but I know of no single document in the history of that science quite so remarkable in its clarity and completeness and its vision of the future.

The original report was a state document, and two thousand copies were printed — a large number for the period. Despite this comparatively large number of copies the report is very rare and commands a high price. The reprint is well published and even in its abbreviated form should be in all medical libraries and public-health collections.

Economic Man: In relation to his natural environment. By C. Reinold Noyes. In two volumes. 8°, cloth. Vol. I, 692 pp.; Vol. II, 751 pp. New York: Columbia University Press, 1948. $15.00 for the set.

This treatise is an important medical reference work. The first six chapters, and their appendixes, of nearly five hundred pages, constitute a mass of new material in the biologic sciences, including physiology and especially neurophysiology, classified under the heading of "wants," present and future. In formulating his synthesis Mr. Noyes has consulted a great number of scattered research articles and reports. Likewise, the most recent research on the brain has been utilized. The work has been in progress for seventeen years. Mr. Noyes, although an economist, has an excellent background for the biologic aspects of his subject. He is a graduate of Yale University, and pursued

special studies at Johns Hopkins University in the Department of Psychology and in the Medical School. Additional extensive research was done in the libraries of the New York Academy of Medicine, Columbia University and Dartmouth College. A bibliography of 450 titles is appended to the text. There is a good index. The treatise should be in all biologic libraries and in the reference collections of medical school and regional medical libraries.

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

The Thyroid and its Diseases. By J. H. Means, M.D. Jackson Professor of Clinical Medicine, Harvard Medical School, and chief of the medical services, Massachusetts General Hospital. With chapters on *Pathology* and on *Tumors of the Thyroid*, by R. W. Rawson, M.D., assistant professor of medicine, Harvard Medical School, and associate physician, Massachusetts General Hospital; and on *Surgery of the Thyroid*, by Oliver Cope, M.D., assistant professor of surgery, Harvard Medical School, and visiting surgeon, Massachusetts General Hospital. 8°, cloth, 571 pp., with illustrations. Second edition. Philadelphia: J. B. Lippincott Company, 1948. $12.00.

This standard treatise has been thoroughly revised and brought up to date since the publication of the first edition in 1937. It reflects the work carried on in the Thyroid Clinic of the Massachusetts General Hospital. Special chapters on surgery of the thyroid gland by Oliver Cope, M.D., and on pathology and on tumors by R. W. Rawson, M.D., have been added. Lists of references are appended to the various chapters, and there is a good index. The volume is a good example of excellent publishing. It is essential for all medical libraries and to all persons interested in the thyroid gland.

The Hygiene of the Breasts. By Clifford F. Dowkontt, M.D. 12°, cloth, 222 pp., with illustrations. New York: Emerson Books, Incorporated, 1948. $2.50.

This popular manual is written by a surgeon who specializes in plastic surgery of the breasts. It is hoped that it will encourage women to take better care of their breasts. There is a special chapter on corsets. The text is concluded with a glossary of terms and an index.

Manual of Urology. By R. M. LeComte, M.D. Fourth edition. 8°, cloth, 311 pp., witl. 58 illustrations. Baltimore: Williams and Wilkins Company, 1948. $4.00.

This manual was first published in 1933. Four years have elapsed since the printing of the third edition. The text has been revised and brought up to date, and the use of penicillin and streptomycin has been included. The volume is intended for the student of urology. The material is well arranged, and there is a good bibliography and an index of subjects. The book is well published.

Neurosurgical Pathology. By I. Mark Scheinker, M.D., assistant professor of neuropathology and assistant professor of medicine (neurology), University of Cincinnati College of Medicine, and neuropathologist and attending neurologist, Cincinnati General Hospital. 8°, cloth, 370 pp., with 238 illustrations. Springfield, Illinois: Charles C Thomas, 1948. $8.75.

This book is well published. The price is reasonable for this type of publication. The volume should be in the reference collection of all medical libraries and available to all neurosurgeons.

Bronchiogenic Carcinoma and Adenoma: With a chapter on mediastinal tumors. By B. M. Fried, M.D., associate attending physician, Montefiore Hospital for Chronic Diseases, New York. 8°, cloth, 306 pp., with 118 illustrations. Baltimore: Williams and Wilkins Company, 1948. $6.00.

In this monograph Dr. Fried discusses the anatomic and physiologic aspects, clinical manifestations, laboratory diagnosis and treatment of bronchiogenic carcinoma and adenoma, and mediastinal tumors. The work is based on a large clinical experience and the study of post-mortem material. Lists of selected references are appended to the different chapters. A good index concludes the text. The volume should be in all medical libraries and should prove of value to all physicians interested in the subject.

Methods in Medical Research. Volume I. Van R. Potter, editor-in-chief. 8°, cloth, 372 pp., with illustrations. Chicago: Year Book Publishers, Incorporated, 1948. $8.00.

This volume forms the first of a projected series and is the joint work of forty-nine contributors. The text is divided into four sections: assay of antibiotics; circulation and blood-flow measurement; selected methods in gastroenterologic research; and cellular respiration. The various articles present the latest methods, technics and apparatus pertaining to the special subjects under discussion. Lists of selected references are appended to the more important articles. The work is well published. It is an essential reference book for all medical libraries and clinical laboratories.

Deafness, Tinnitus, and Vertigo. By Samuel J. Kopetzky, M.D., director of the department and professor of otolaryngology, New York Polyclinic Medical School and Hospital. 8°, cloth, 314 pp., with 30 illustrations and 10 tables. New York: Thomas Nelson and Sons, 1948. $7.50.

This monograph covers the whole field of deafness and allied conditions from anatomy to therapy. The tenth chapter discusses the pathological findings and criteria indicating rationally applied therapy in one hundred pages. Pertinent references are appended to the various divisions of the text. The volume is well published and should be in all medical reference collections and in the libraries of specialists on the subject.

Education for Professional Responsibility: A report of the proceedings of the inter-professions conference on education for professional responsibility held at Buck Hill Falls, Pennsylvania, April 12, 13, and 14, 1948. 8°, cloth, 207 pp. Pittsburgh: Carnegie Press, 1948. $3.00.

This volume reports a conference participated in by eighteen leaders in the fields of education in divinity, medicine, law, engineering and business. The subject matter is divided into three parts on professional education: the objectives; content and method; and social and humanistic aspects. Medicine was represented on the panel by William W. Beckman, of Harvard, George P. Berry, of the University of Rochester, and Aura E. Severinghaus, of Columbia. A short bibliography concludes the text. The lack of an index detracts from the reference value of the book. The volume is well published and should prove valuable to persons interested in the subject.

Hemolysis and Related Phenomena. By Eric Ponder, The Nassau Hospital, Mineola, New York. 8°, cloth, 398 pp., with 69 illustrations. New York: Grune and Stratton, 1948. $10.00.

This monograph constitutes a second edition of the author's *The Mammalian Red Cell and the Properties of Hemolytic Systems*, first published in 1934. The text has been amplified and is concluded with a bibliography and indexes of authors and subjects. The publishing is excellent. It is noted with pleasure that a light, soft, nonglare paper has been used for the volume, which should be found in all medical reference collections and should prove useful to specialists in its field.

A Brief History of The South Carolina Medical Association: To which are added short historical sketches of various medical institutions and societies of South Carolina. 8°, cloth, 197 pp. with illustrations and frontispiece. Charleston: South Carolina Medical Association, 1948.

This brief history of the state society also includes the county societies, miscellaneous societies, special societies

and state institutions. The society was founded in 1848, and this volume is issued in commemoration of its centenary. In actuality it comprises a short history of medicine in South Carolina for the past hundred years. There is a special chapter on the ether controversy in which it is claimed that ether was first used for the purpose of producing insensibility by Dr. P. A. Wilhite, of Anderson, South Carolina, in 1841. The text is the joint work of twenty-five authors supervised by a special committee of the Society. A good index concludes the volume. The publishing is excellent.

Hungerkrankheit, Hungerödem, Hungertuberkulose: Historische, klinische, pathophysiologische und pathologisch-anatomische Studien und Beobachtungen an ehemaligen Insassen aus Konzentrationslagern. By A. Hottinger, O. Gsell, E. Uehlinger, C. Salzmann and A. Labhart. With a preface by Oberst K. Kistler, Zürich, director of the Militärsanitätsanstalt 4. 8°, cloth, 297 pp., with 171 Abbildungen. Basel: Benno Schwabe and Co., 1948. Ganzleinen Fr. 28.

This monograph is based on a study of 5000 severely wounded and sick soldiers hospitalized in Switzerland during 1944 and 1945. "Hungerkrankheit" may be freely translated as chronic illness due to insufficient food over a long period. The text is divided into five parts. The first constitutes a short, historical sketch, the second a clinical study of the cases of Hungerkrankheit and their treatment, the third and fourth the clinical aspects, pathogenesis and pathological anatomy of Hungerkrankheit and Hungerödem, and the fifth tuberculosis as a complication of hunger disease. The monograph is well published, but the lack of an index detracts from its value as a reference book. It should be in all the large medical libraries and in all collections on metabolism and tuberculosis.

Klinik und Therapie der Leptomeningitiden für Ärzte und Studierende. By Hermann Czickeli. 8°, paper, 95 pp. Vienna: Wilhelm Maudrich, 1948. $2.00.

This monograph discusses the various types of meningitis. An appendix concerns the technic of lumbar puncture. Thirty-seven pages are devoted to epidemic cerebrospinal meningitis. There is a valuable table on the changes in the spinal fluid in various diseases of the central nervous system. The material is well organized. A short bibliography ends the volume. Unfortunately, there is not an index. The monograph should be available to all physicians interested in the subject.

The Rh Blood Groups and Their Clinical Effects. By P. L. Mollison, A. E. Mourant, and R. R. Race. 8°, paper, 74 pp. London: His Majesty's Stationery Office, 1948. 1s. 6d. net. Privy Council. Medical Research Council Memorandum No. 19.

In this small pamphlet Dr. Mollison presents the latest information on the Rh blood groups. The text is divided into three parts: the Rh groups; clinical considerations; and Rh testing. Selected references are appended to each part.

Die vegetativen Anfälle des Herzens. By Kurt Polzer and Walter Schober. 8°, paper, 97 pp. Vienna: Wilhelm Maudrich, 1948. $2.50.

In this monograph the heart conditions due to the action of the sympathetic nervous system are discussed. The material is well organized, proceeding from anatomy and physiology to treatment. There is a bibliography and an index. The pamphlet should be available to physicians interested in cardiology.

Erinnerungen, Erfahrungen und Methoden eines Praktikers. By Eduard von Hueber. 8°, paper, 72 pp. Vienna: Wilhelm Maudrich, 1948. $1.00.

This small pamphlet is devoted to the achievements, ideas and methods of a general practitioner. Two thirds of the text deals with therapeutics, and the remainder with diagnosis.

Psychiatry in General Practice. By Melvin W. Thorner, M.D., D. Sc., assistant professor of neurology, The Graduate School of Medicine, University of Pennsylvania. 8°, cloth, 659 pp. Philadelphia: W. B. Saunders Company, 1948. $8.00.

This new book on psychiatry has been written primarily for the general practitioner and the internist. The language used is purposely simple and nontechnical, and the material is well organized. The text is divided into two main sections. The first discusses the various types of psychiatric patients. The second deals with examination, diagnosis and treatment. Two appendixes contain important material on the classification of mental disorders and on commitment procedures, including an analysis of the law in the various States. References to the literature are appended to each chapter. A good index concludes the book. The publishing is excellent in every way. The volume should be in all medical libraries and should be available to all physicians.

The Surgery of Abdominal Hernia. By George B. Mair, M.D., F.R.F.P.S.G., F.R.C.S.E., surgeon, Law Junction Hospital, Lanarkshire. 8°, cloth, 408 pp., with 138 illustrations. Baltimore: Williams and Wilkins Company, 1948. $7.00.

Dr. Mair, in this monograph, endeavors to clarify many points of etiology and treatment. He has been concerned with the high rate of recurrence and attributes it in part to faulty technic. The work is primarily intended for those who are especially interested in hernia, including anatomists, physiologists and sociologists. The text is well written, and lists of selected references are appended to the various chapters. There is a good index. The book is well published in every way. The illustrations are excellent. The monograph should be in all medical libraries and available to all surgeons.

Human Biochemistry. By Israel S. Kleiner, Ph.D., professor of biochemistry and director of the department of physiology and biochemistry, New York Medical College, Flower and Fifth Avenue Hospitals. Second edition. 8°, cloth, 649 pp., with 77 illustrations and 5 color plates. St. Louis: C. V. Mosby Company, 1948. $7.00.

This textbook for students, first published in 1945, has been revised, and the material brought up to date. A new chapter has been added on chemical structure in relation to biologic phenomena. Lists of references are appended to the various chapters. There is a comprehensive index. The material is well organized. The publishing is excellent. The volume should prove useful to students and others interested in the subject.

Diseases of the Adrenals. By Louis J. Soffer, M.D., associate attending physician, The Mount Sinai Hospital, New York City, and assistant clinical professor of medicine, Columbia University College of Physicians and Surgeons, New York City. Second edition. 8°, cloth, 320 pp., with 45 illustrations and 3 color plates. Philadelphia: Lea and Febiger, 1948. $6.50.

This second edition of a standard work has been thoroughly revised and brought up to date. The material is well arranged, and the book is well published. Bibliographies are attached to the different chapters, and there is an index. The volume should be in all medical libraries.

Crime and the Mind: An outline of psychiatric criminology. By Walter Bromberg, M.D. 8°, cloth, 219 pp. Philadelphia: J. B. Lippincott Company, 1948. $4.50.

This special monograph was developed from the clinical study of hundreds of convicted criminals. The case material was derived from the Court of General Sessions, New York, and several United States Navy prisons. The text is divided into two parts. The first discusses the legal and social environment of the criminal. The second deals with the individual criminal, including the psychopathic personality, the neurotic offender and emotional immaturity and crime. The last chapter, entitled "Cure of Crime," stresses the value of psychotherapy. There is an extensive bibliography and a good index. The text is well printed with a good type on good paper. The book should be available to all psychiatrists and psychologists.

(*Notices on page xi*)